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Service



190V1SB/93  
190V1SB/00  
190V1SB/62  
190V1SB/27



# Service Manual

Description	Page	Description	Page
Table of Contents.....	1	6.1 Main Board.....	19
Revision List.....	2	6.2 Power Board.....	23
Important Safety Notice.....	3	6.3 Key Board.....	25
1. Monitor Specifications.....	4	7. PCB Layout.....	26
2. LCD Monitor Description.....	5	7.1 Main Board.....	26
3. Operation instructions.....	6	7.2 Power Board.....	28
3.1 General Instructions.....	6	7.3 Key Board.....	30
3.2 Control buttons.....	6	8. Wiring Diagram.....	31
3.3 OSD Menu.....	8	9. Scalar Board Overview.....	32
4. Input/Output Specification.....	10	10. Mechanical Instructions.....	33
4.1 Input Signal Connector.....	10	11. Repair Flow Chart.....	37
4.2 Factory Preset Display Modes.....	10	12. ISP Instructions.....	43
4.3 Pixel Defect Policy.....	11	13. DDC Instructions.....	46
4.4 Failure Mode of Panel.....	14	14. White Balance, Luminance Adjustment.....	56
5. Block Diagram.....	15	15. Monitor Exploded View.....	58
5.1 Software Flow Chart.....	15	16. Recommended & Spare Parts List.....	59
5.2 Electrical Block Diagram.....	17	17. Different Parts List.....	61
6. Schematic Diagram.....	19	18. General Product Specification.....	63

## SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

[illegible]

## Important Safety Notice

Proper service and repair is important to the safe, reliable operation of all Philips Company Equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, a customer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

Hereafter throughout this manual, Philips Company will be referred to as Philips.

### WARNING

Use of substitute replacement parts, which do not have the same, specified safety characteristics, may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design.

### FOR PRODUCTS CONTAINING LASER:

DANGER- There is invisible laser radiation when open. AVOID DIRECT EXPOSURE TO BEAM.

CAUTION-Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CAUTION -The use of optical instruments with this product will increase eye hazard.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

Take care during handling the LCD module with backlight unit:

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment person's body is grounded through wristband.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- Avoid contact with water as it may a short circuit within the module.
- If the surface of panel becomes dirty, please wipe it off with a soft material. (Cleaning with a dirty or rough cloth may damage the panel.)

## 1. Monitor Specifications

### 1.1 Technical specifications

<b>LCD PANEL</b>	
• Type	TFT LCD
• Screen size	19" Visual
• Pixel pitch	0.285mm x 0.285mm
• LCD Panel type	1440*900 pixels
	R.G.B vertical stripe
	Anti-glare polarizer, hard coated
• Effective viewing area	408.24 x 255.15 mm
Display Colors	16.7M
<b>SCANNING</b>	
• Vertical refresh rate	56 Hz – 76 Hz
• Horizontal Frequency	30 kHz - 83 kHz
<b>Video</b>	
• Video dot rate	170 MHz
• Input impedance	
- Video	75 OHM
- Sync	2.2K OHM
• Input signal levels	0.7Vpp
• Sync input signal	Separate Sync
	Composite Sync
	Sync On Green
• Sync polarities	Positive and Negative

\* This data is subject to change without notice.



## 1.2 Physical specifications

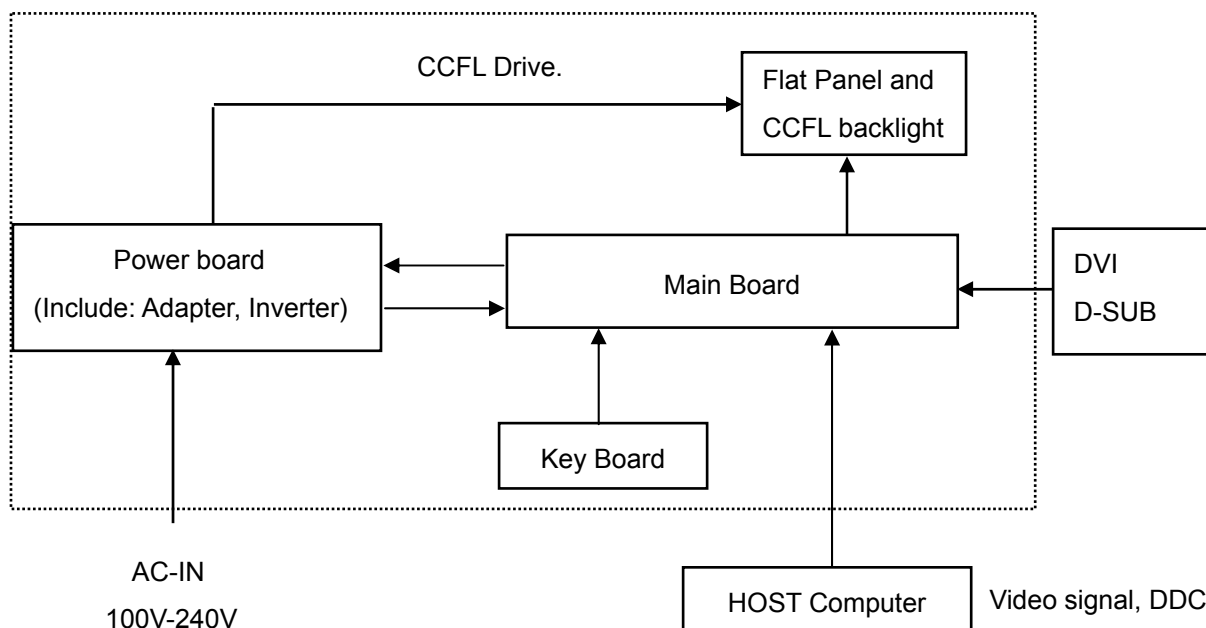
• Tilt	- 5°~ 20°
• Power Supply	100~240 V AC, 50/60Hz
• Power Consumption	<35W (Typ.)
• Temperature	0℃ to 40℃ (operating)
	-20℃ to 60℃ (storage)
• Relative Humidity	20~80%
• System MTBF	50K hours (CCFL 50K hours)
• Cabinet Color	190V1SB: Black

## 2. LCD Monitor Description

The LCD monitor will contain a main board, a power board and a key board which house the flat panel control logic, brightness control logic and DDC.

The power board will provide AC to DC Inverter voltage to drive the backlight of panel and the main board chips each voltage.

Monitor Block Diagram



### 3. Operating Instructions

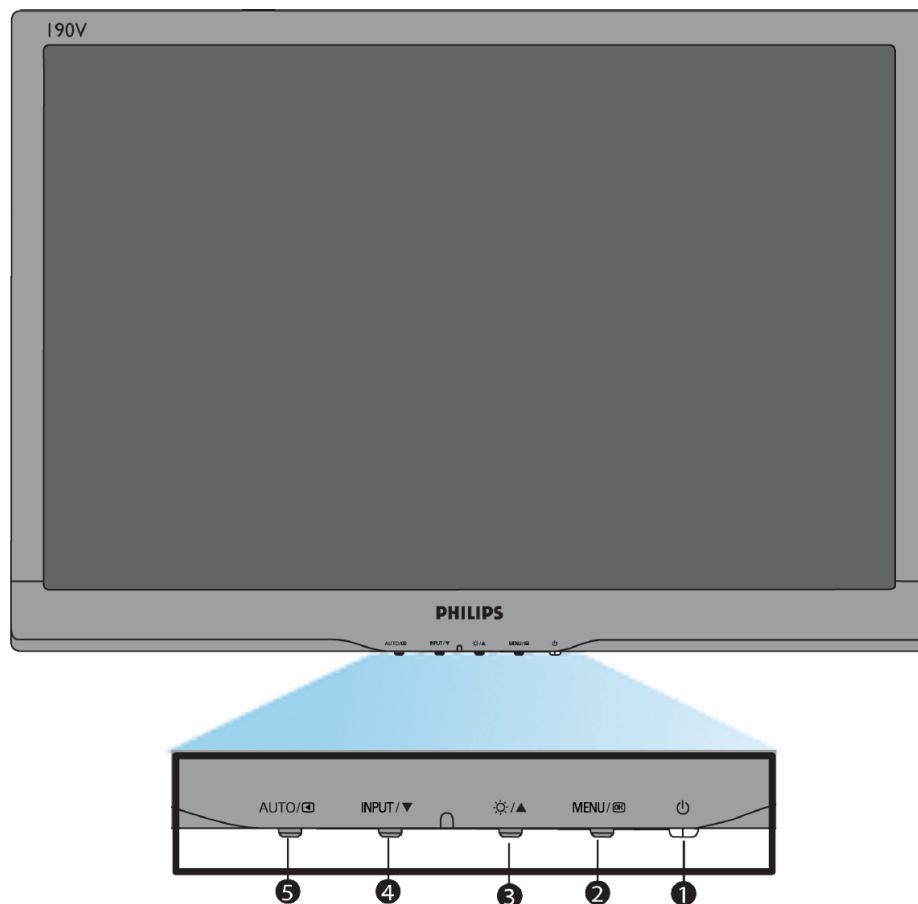
#### 3.1 General Instructions



Press the power button to turn the monitor on or off. The other control knobs are located at front panel of the monitor (see figure). By changing these setting, the picture can be adjusted to your personal preference.

- \* The power cord should be connected.
- \* Press the power button to turn on the monitor. The power indicator will light up.

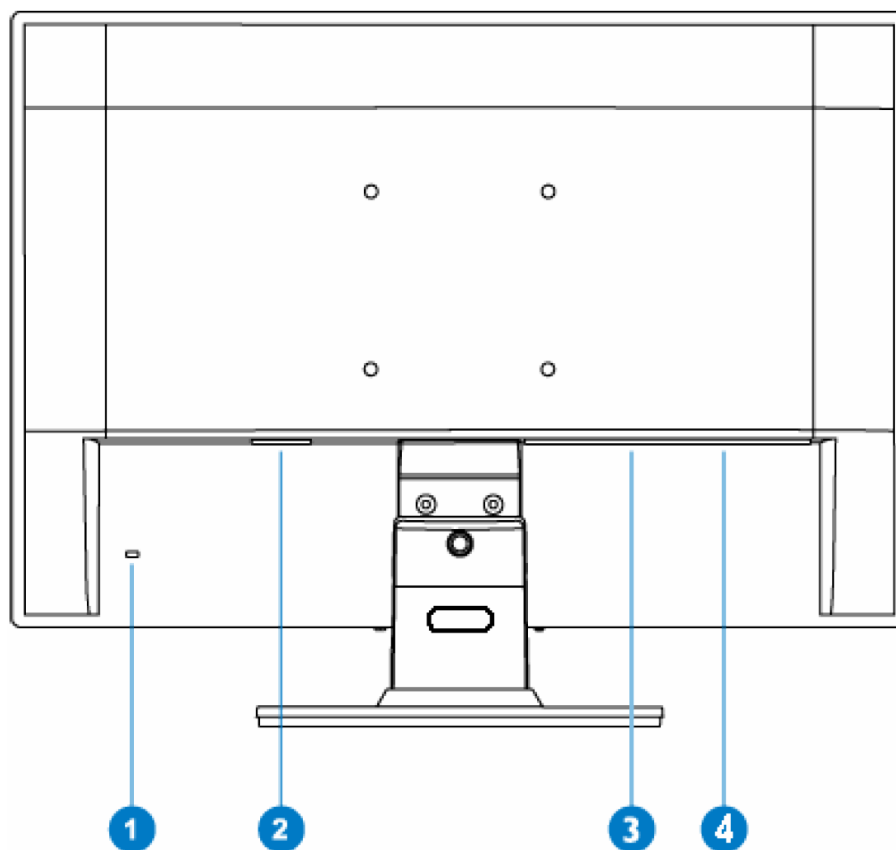
#### 3.2 Control Buttons

Front View



- 1  To switch monitor's power on and off
- 2 **MENU/OK** To access OSD menu/Confirm
- 3  To adjust brightness of the display
- 4 **INPUT/▼** To change the signal input source
- 5 **AUTO/◀** Automatically adjust the horizontal position, vertical position, and phase and clock settings  
Return to previous OSD levels

**Rear View**



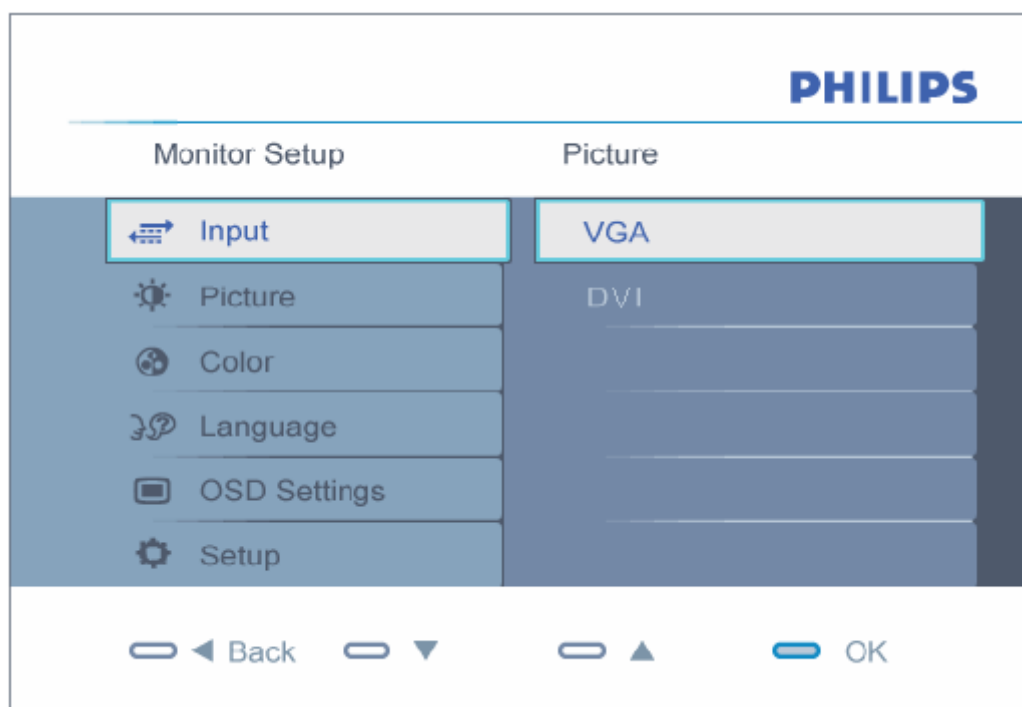
- 1 Kensington anti-thief lock
- 2 AC power input
- 3 DVI-D(available for selective models)
- 4 VGA input

### 3.3 OSD Menu

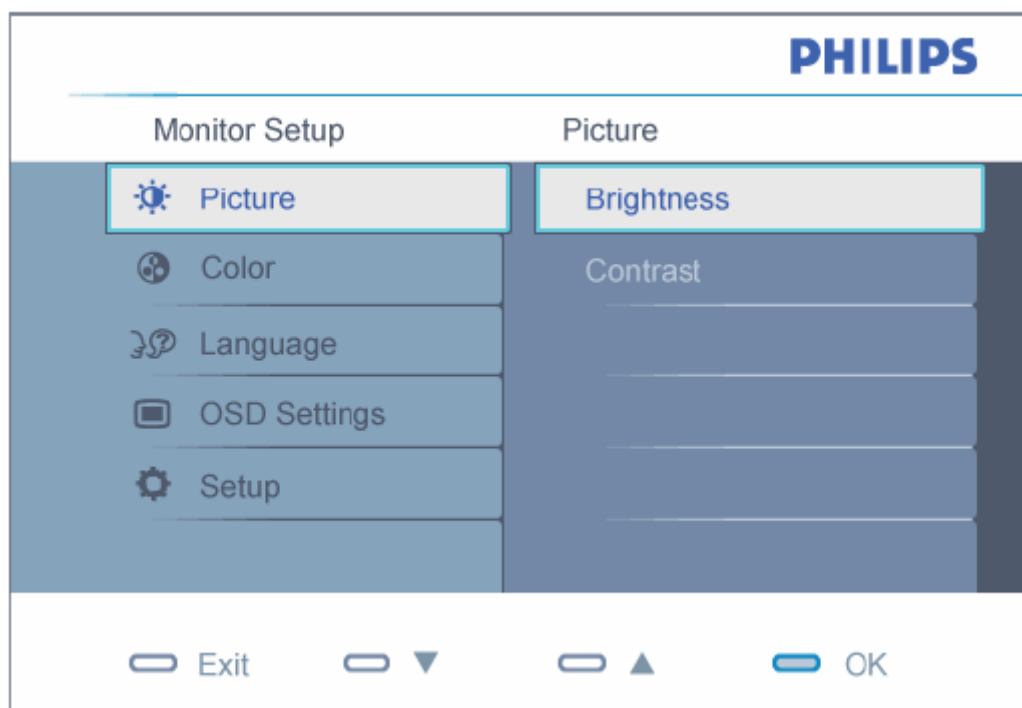
This is a feature in all Philips LCD monitors. It allows an end user to adjust screen performance of the monitors directly through an on-screen instruction window. The user interface provides user-friendliness and ease-of-use when operating the monitor.

When you press the **MENU/OK** button on the front control of your monitor, the On-Screen-Display (OSD) main controls window will pop up and you can then start making adjustments to your monitor's various features. Use the **▲ ▼** keys to make your adjustments.

#### Dual Model

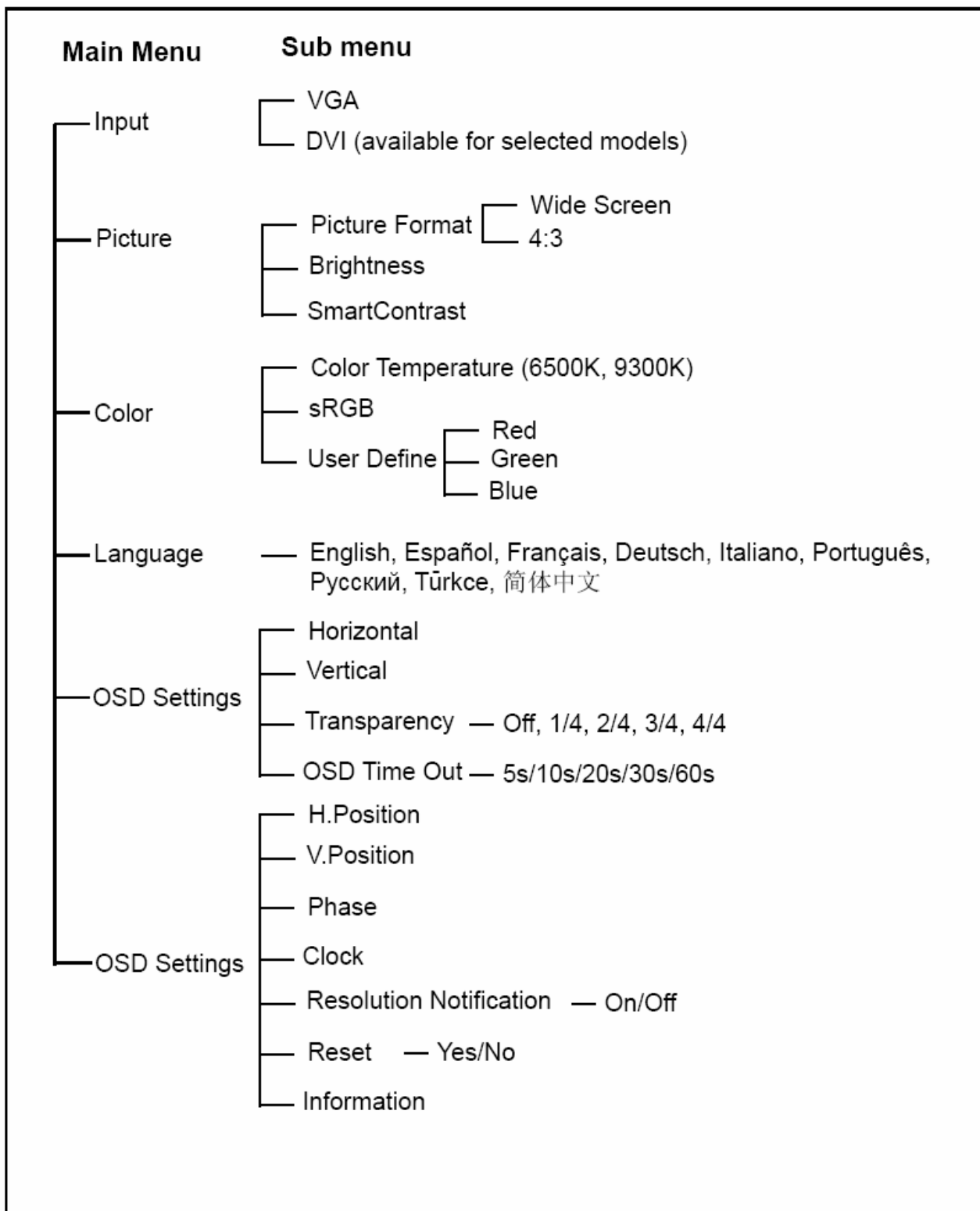


#### Analog Model



## The OSD tree

Below is an overall view of the structure of the On-Screen Display. You can use this as a reference when you want to work your way around the different adjustments later on.



## 4. Input/ Output Specification

### 4.1 Input Signal Connector

Analog connectors

Pin No.	Signal Name	Pin No.	Signal Name
1	Red video input	9	DDC +5V
2	Green video input/ SOG	10	Logic ground
3	Blue video input	11	Ground
4	Sense (GND)	12	Serial data line (SDA)
5	Cable Detect (GND)	13	H. Sync/H+V.Sync
6	Red video ground	14	V.Sync
7	Green video ground	15	Data clock line (SCL)
8	Blue video ground		

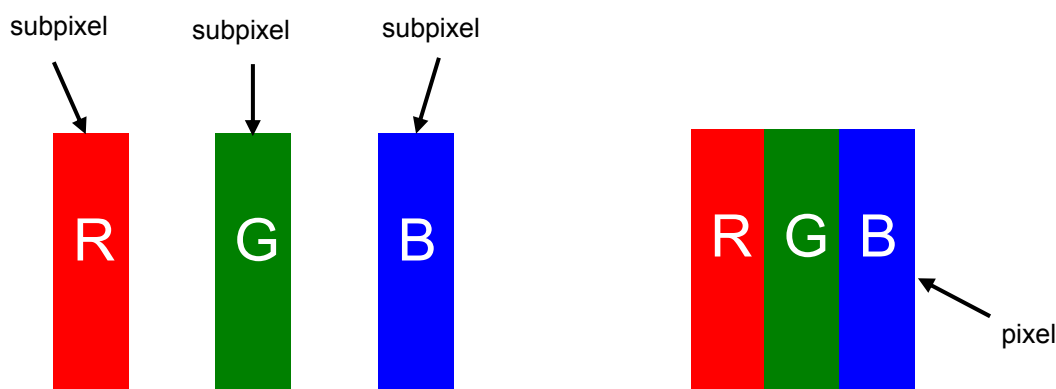
  

### 4.2 Factory Preset Modes

H. freq (KHz)	Resolution	V. freq (Hz)
31.47	720 x 400	70.09
31.47	640 x 480	59.94
37.50	640 x 480	75.00
37.88	800 x 600	60.32
46.88	800 x 600	75.00
48.36	1024 x 768	60.00
60.02	1024 x 768	75.03
63.89	1280 x 1024	60.02
79.98	1280 x 1024	75.03
55.94	1440 x 900	59.89
70.64	1440 x 900	74.98

### 4.3 Pixel Defect Policy

Philips strives to deliver the highest quality products. We use some of the industry's most advanced manufacturing process and practice stringent quality control. However, pixel or sub pixel defects on the TFT LCD panels used in flat panel monitors are sometimes unavoidable. No manufacturer can guarantee that panels will be free from pixel defects, but Philips guarantees that any monitor with an unacceptable number of defects will be repaired or replaced under warranty. This notice explains the different types of pixel defects and defines acceptable defect levels for each type. In order to qualify for repair or replacement under warranty, the number of pixel defects on a TFT LCD panel must exceed these acceptable levels. For example, no more than 0.0004% of the sub pixels on a 19" XGA monitor may be defective. Furthermore, Philips sets even higher quality standard for certain types or combinations of pixel defects that are more noticeable than others. This policy is valid worldwide.



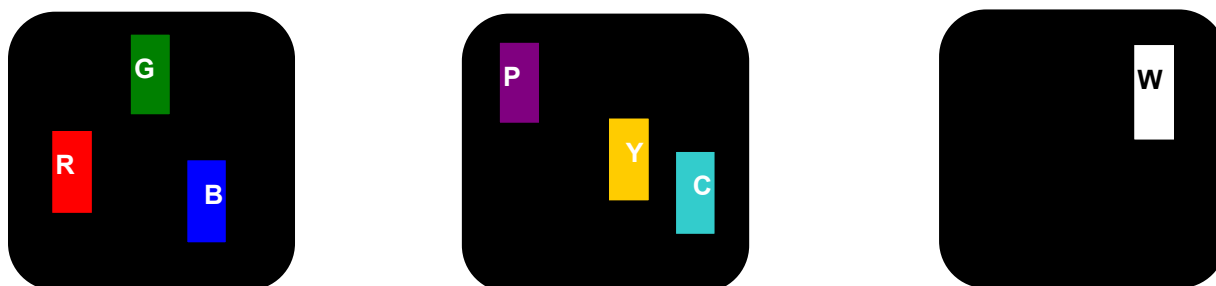
#### Pixels and Sub pixels

A pixel, or picture element, is composed of three sub pixels in the primary colors of red, green and blue. Many pixels together form an image. When all sub pixels of pixel are lit, the three colored sub pixels together appear as a single white pixel. When all are dark, the three colored sub pixels together appear as a signal black pixel. Other combinations of lit and dark sub appear as single pixels of other colors.

#### Types of Pixel Defects

Pixel and sub pixel defects appear on the screen in different ways. There are two categories of pixel defects and several types of sub pixel defects within each category.

**Bright Dot Defects** Bright dot defects appear as pixels or sub pixels that are always lit or 'on'. That is, a Bright dot is a sub-pixel that stands out on the screen when the monitor displays a dark pattern. There are three types of bright dot defects:



Two adjacent lit sub pixels:

- Red + Blue = Purple

- Red + Green = Yellow

- Green + Blue = Cyan (Light Blue)

Three adjacent lit sub pixels

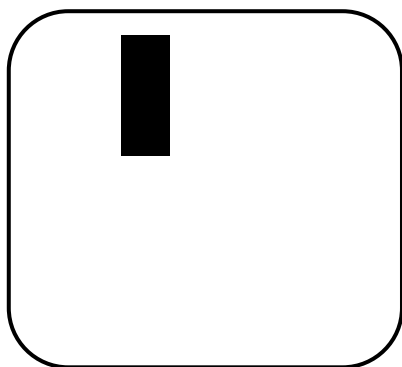
(one white pixel)

One lit red, green or blue sub pixel

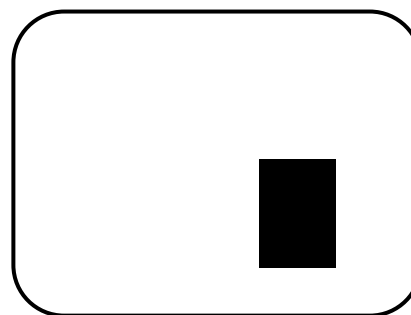


A red or blue bright dot must be more than 50 percent brighter than neighboring dots while a green bright dot is 30 percent brighter than neighboring dots.

**Black Dot Defects** Black dot defects appear as pixels or sub pixels that are always dark or 'off'. That is, a dark dot is a sub-pixel that stands out on the screen when the monitor displays a light pattern. There are two types of black dot defects:



One dark sub pixel



Two or three adjacent dark sub pixels

#### Proximity of Pixel Defects

Because pixel and sub pixels defects of the same type that are near to one another may be more noticeable, Philips also specifies tolerances for the proximity of pixel defects.

#### Pixel Defect Tolerances

In order to qualify for repair or replacement due to pixel defects during the warranty period, a TFT LCD panel in a Philips flat panel monitor must have pixel or sub pixel defects exceeding the tolerances listed in the following tables.

BRIGHT DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	190V1
1 lit subpixel	3
2 adjacent lit subpixels	1
3 adjacent lit subpixels (one white pixel)	0
Distance between two bright dot defects *	>15mm
Total bright dot defects of all types	3



BLACK DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	190V1
1 dark subpixel	5
2 adjacent dark subpixels	2
3 adjacent dark subpixels	0
Distance between two black dot defects *	>15mm
Total black dot defects of all types	5

TOTAL DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	220E1
Total bright or black dot defects of all types	5

Note:

\* 1 or 2 adjacent sub pixel defects = 1 dot defect

## 4.4 Failure Mode Of Panel

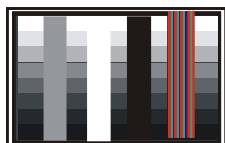
Quick reference for failure mode of LCD panel

this page presents problems that could be made by LCD panel.  
It is not necessary to repair circuit board. Simply follow the mechanical  
instruction on this manual to eliminate failure by replace LCD panel.

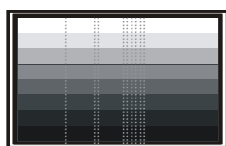
Failure description

Phenomenon

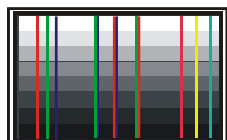
Vertical block defect



Vertical dim lines



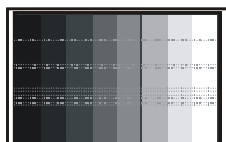
Vertical lines defect  
(Always bright or dark)



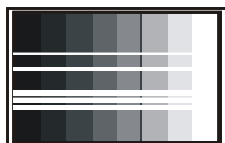
Horizontal block defect



Horizontal dim lines



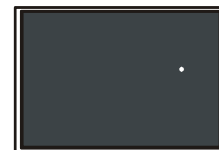
Horizontal lines defect  
(Always bright or dark)



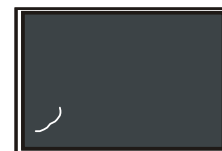
Has bright or dark pixel



Polarizer has bubbles



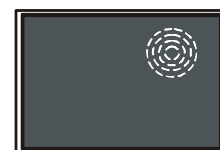
Polarizer has bubbles



Foreign material inside  
polarizer. It shows liner or  
dot shape.



Concentric circle formed



Bottom back light of LCD is  
brighter than normal



Back light un-uniformity

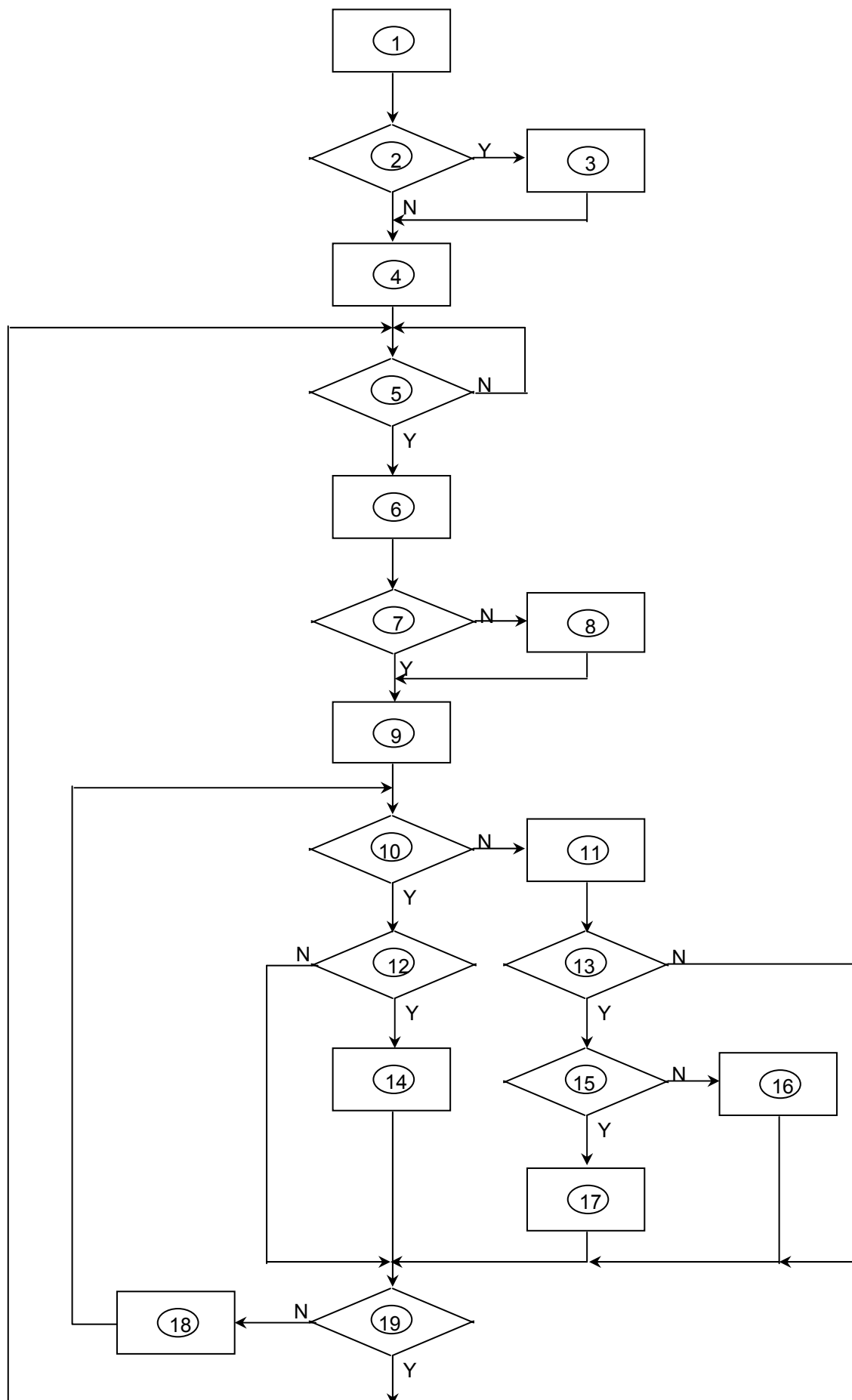


Backlight has foreign material.  
Black or white color, liner or  
circular type



## 5. Block Diagram

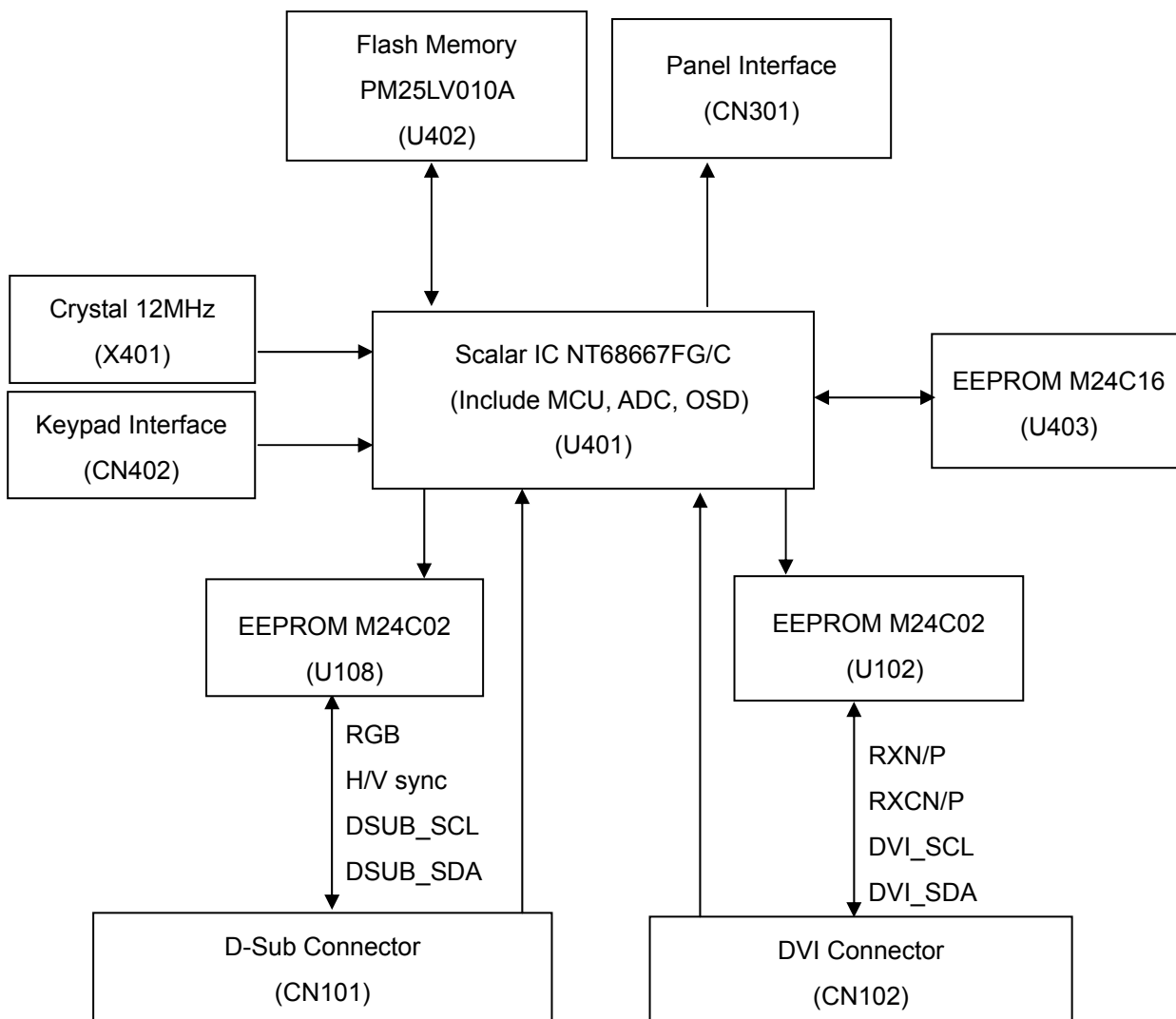
### 5.1 Software Flow Chat



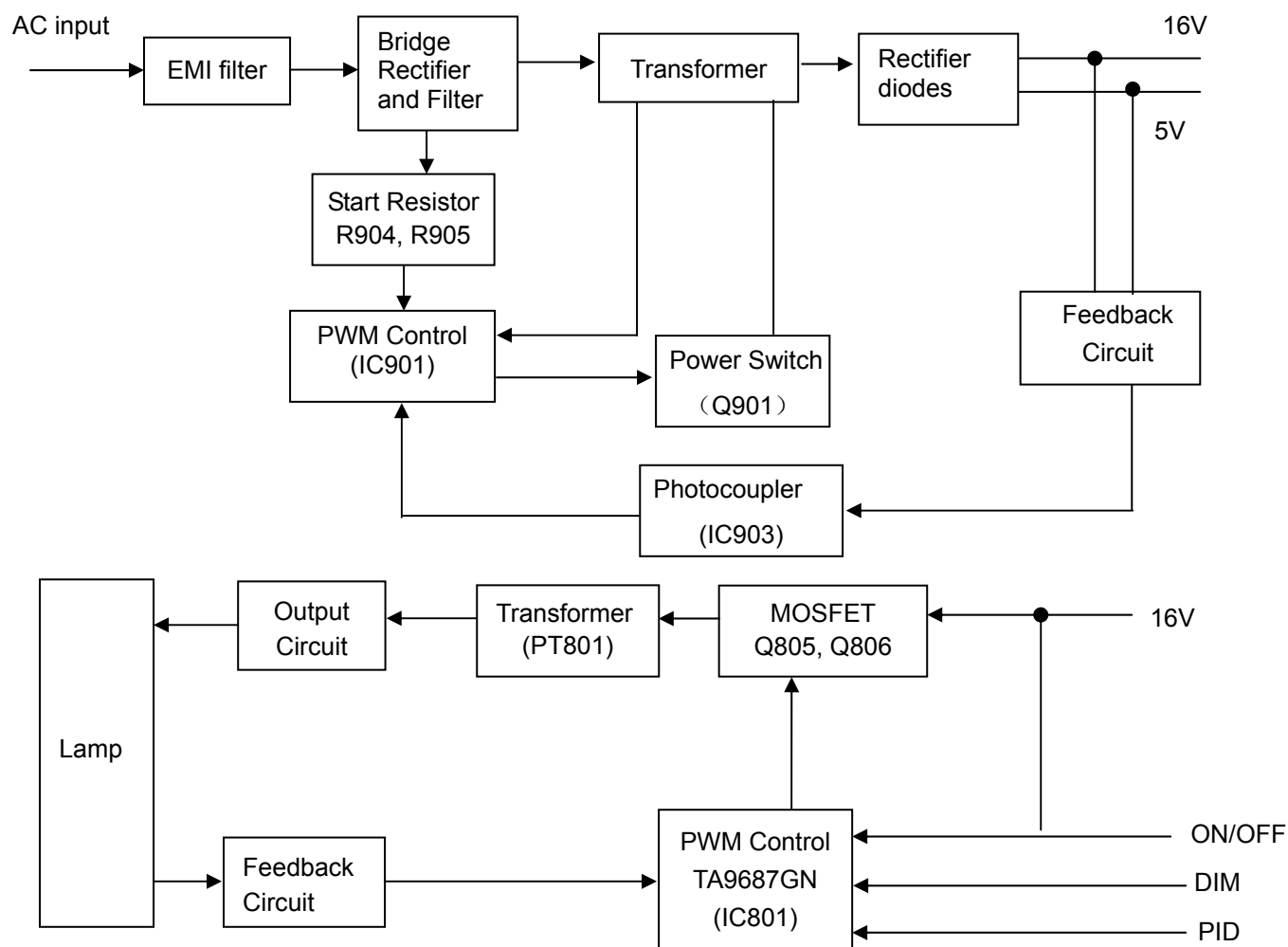
1) MCU initializes.
2) Is the EPROM blank?
3) Program the EPROM by default values.
4) Get the PWM value of brightness from EPROM.
5) Is the power key pressed?
6) Clear all global flags.
7) Are the AUTO and SELECT keys pressed?
8) Enter factory mode.
9) Save the power key status into EPROM. Turn on the LED and set it to green color. Scalar initializes
10) In standby mode?
11) Update the lifetime of back light.
12) Check the analog port, are there any signals coming?
13) Does the scalar send out an interrupt request?
14) Wake up the scalar.
15) Are there any signals coming from analog port?
16) Display "No connection Check Signal Cable" message. And go into standby mode after the message disappears.
17) Program the scalar to be able to show the coming mode.
18) Process the OSD display.
19) Read the keyboard. Is the power key pressed?

## 5.2 Electrical Block Diagram

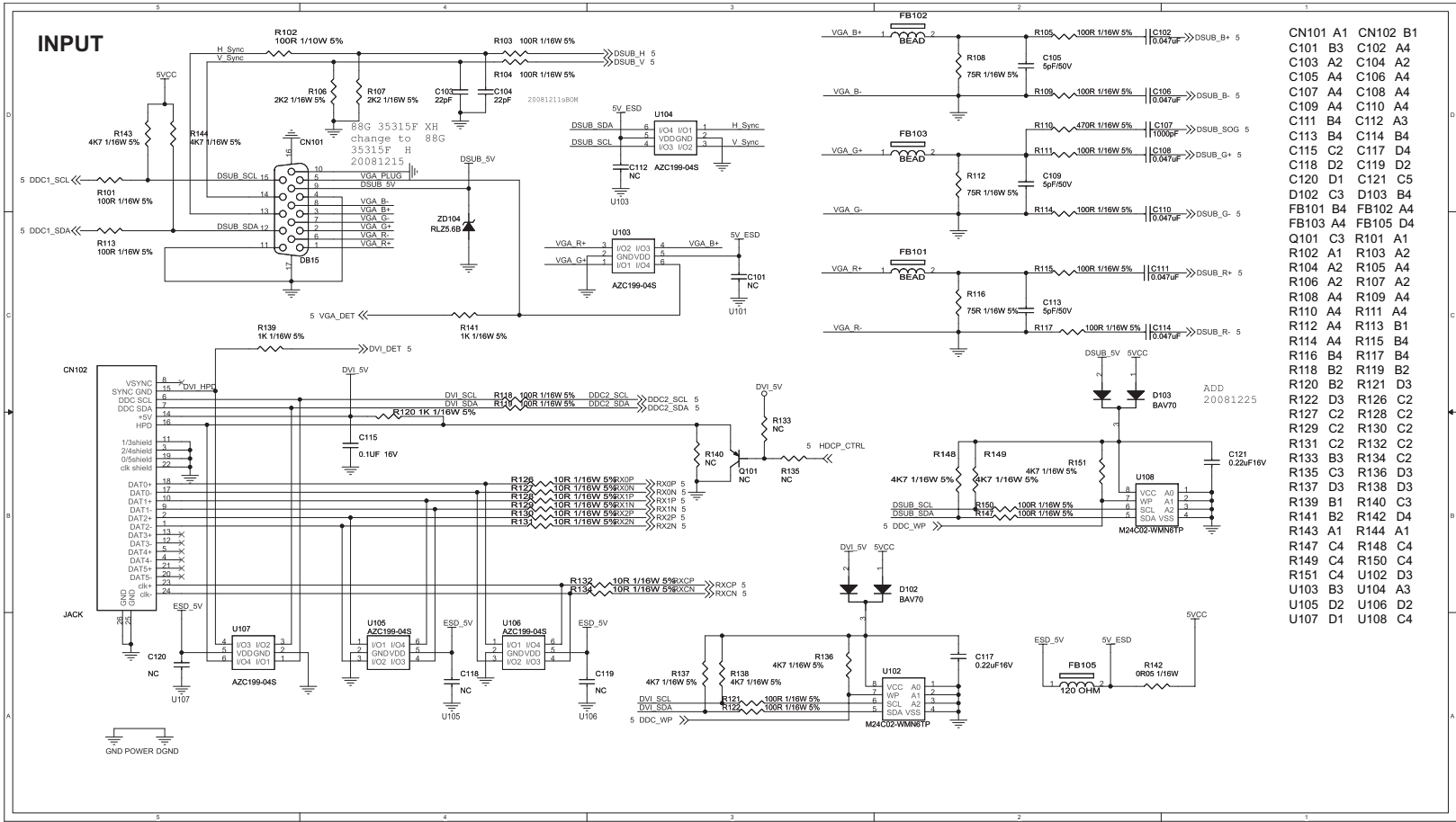
### 5.2.1 Main Board



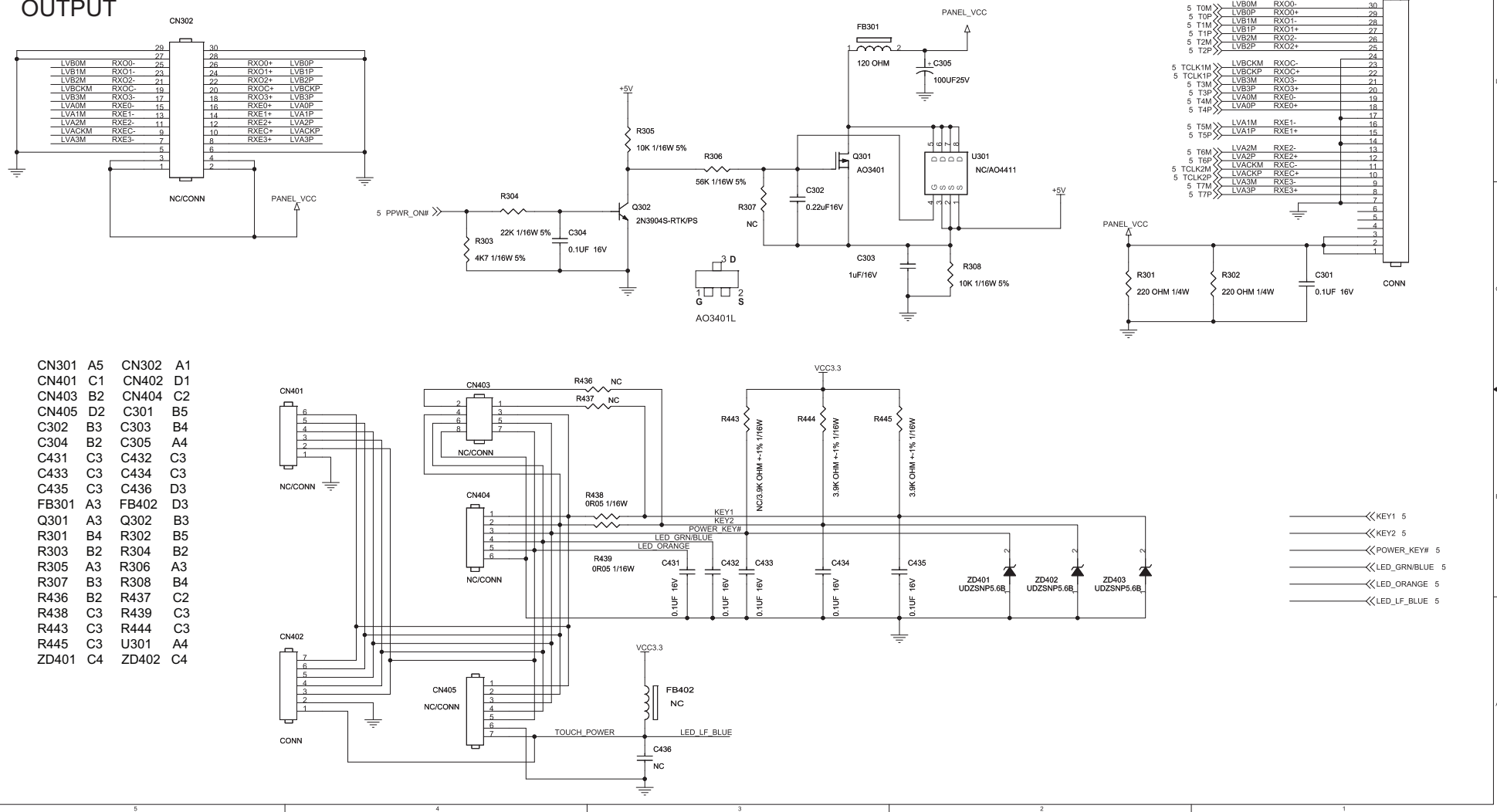
## 5.2.2 Power/Inverter Board



**715G3226-1**

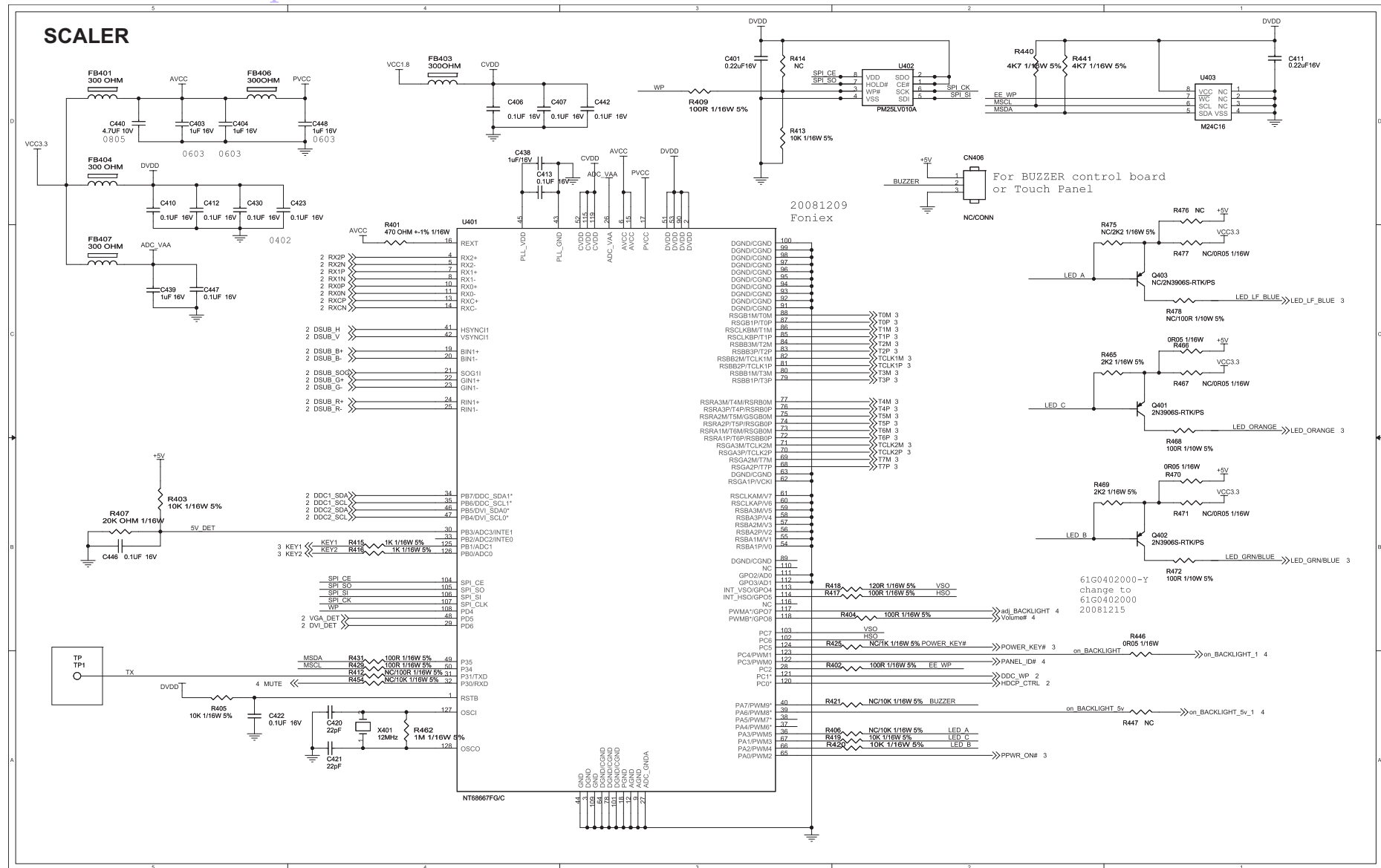


## OUTPUT





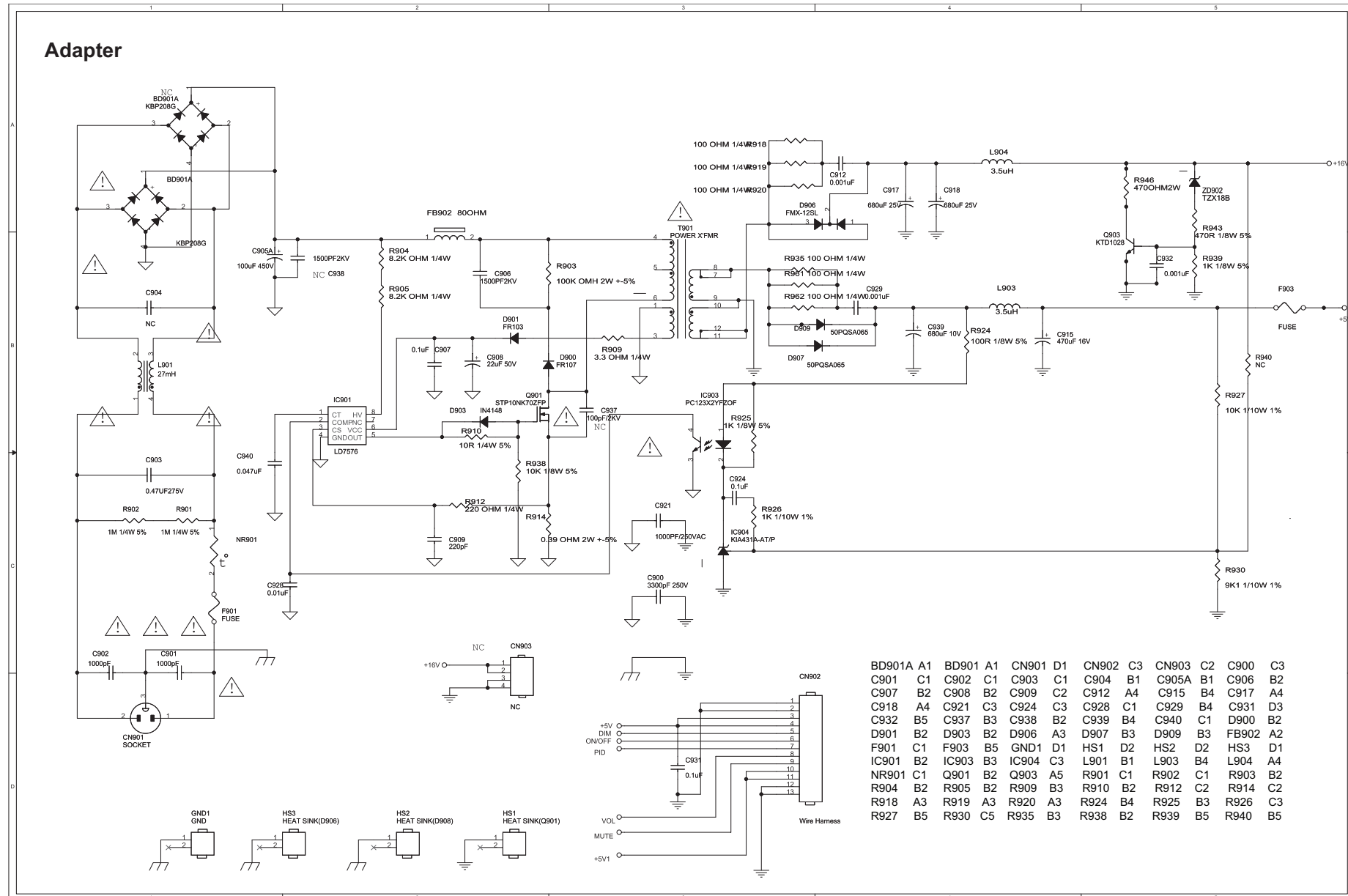
CN701	A1	C701	B2	C702	C1	C703	A2	C704	B5	C705	B5	C706	C4	C707	C5
C708	C4	C709	C4	C710	A2	C711	B4	C712	B1	Q701	C1	R701	A3	R702	C1
R703	A2	R704	C2	R705	B2	R706	B2	R707	A2	R708	C2	R710	A2	R711	C2

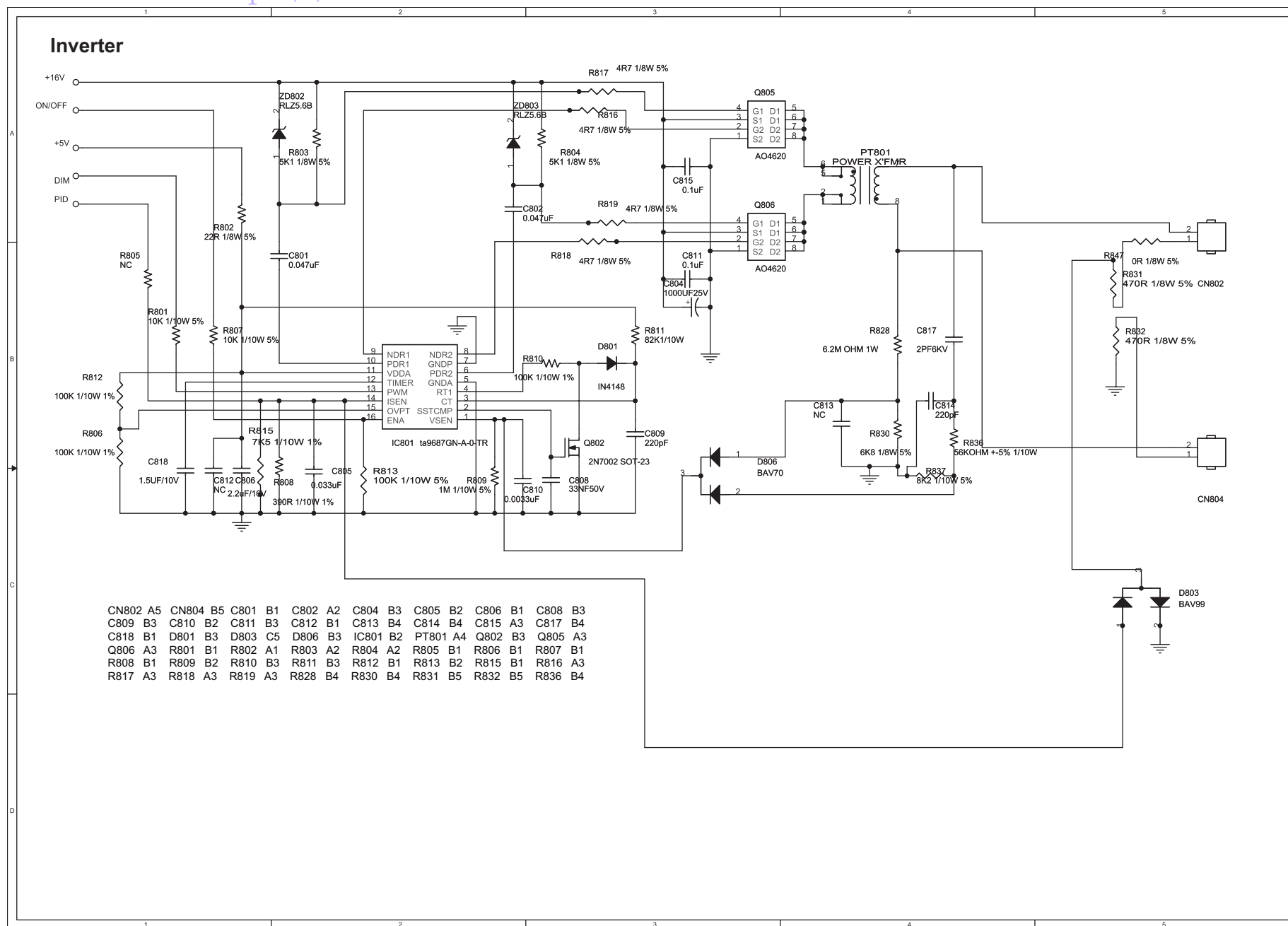


CN406 A4 C401 A3 C403 A1 C404 A1 C406 A2 C407 A2 C410 A1 C411 A5 C412 A1 C413 A2 C420 D2 C421 D2 C422 D1 C423 A1 C430 A1 C438 A2 C439 B1 C440 A1  
C442 A3 C446 C1 C447 B1 C448 A2 FB401 A1 FB403 A2 FB404 A1 FB406 A1 FB407 B1 Q401 B5 Q402 C5 Q403 B5 R401 B2 R402 D4 R403 C1 R404 C4 R405 D1 R406 D4  
R407 C1 R409 A3 R412 D2 R413 A3 R414 A3 R415 C2 R416 C2 R417 C4 R418 C4 R419 D4 R420 D4 R421 D4 R425 C4 R429 D2 R431 C2 R440 A4 R441 A4 R446 C5  
R447 D5 R454 D2 R462 D2 R465 B4 R466 B5 R467 B5 R468 B5 R469 C4 R470 C5 R471 C5 R472 C5 R475 B4 R476 A5 R477 B5 R478 B5 TP1 D1 U401 B2 U402 A4

## 6.2 Power Board

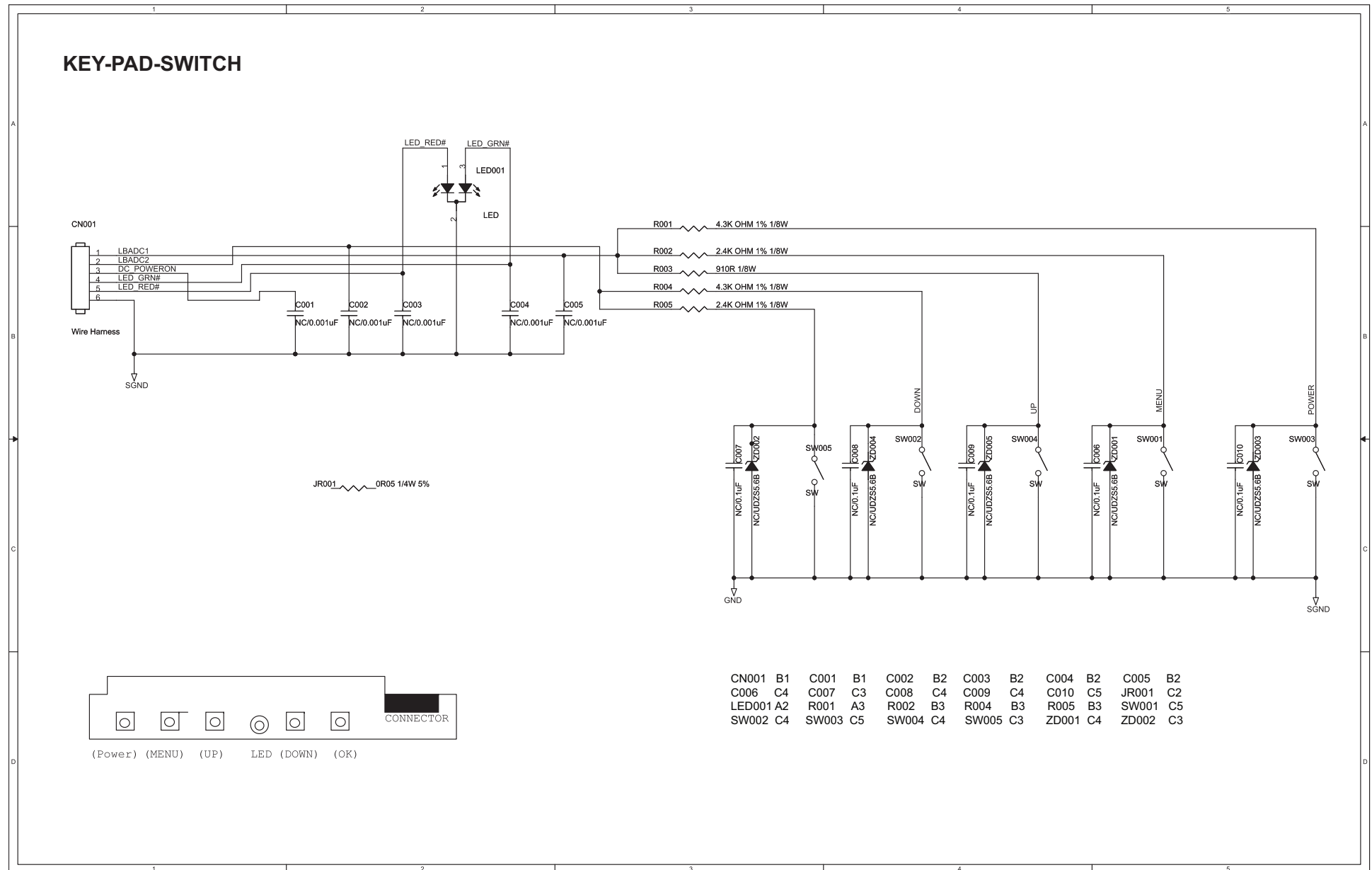
715G2824-3-5





## 6.3 Key Board

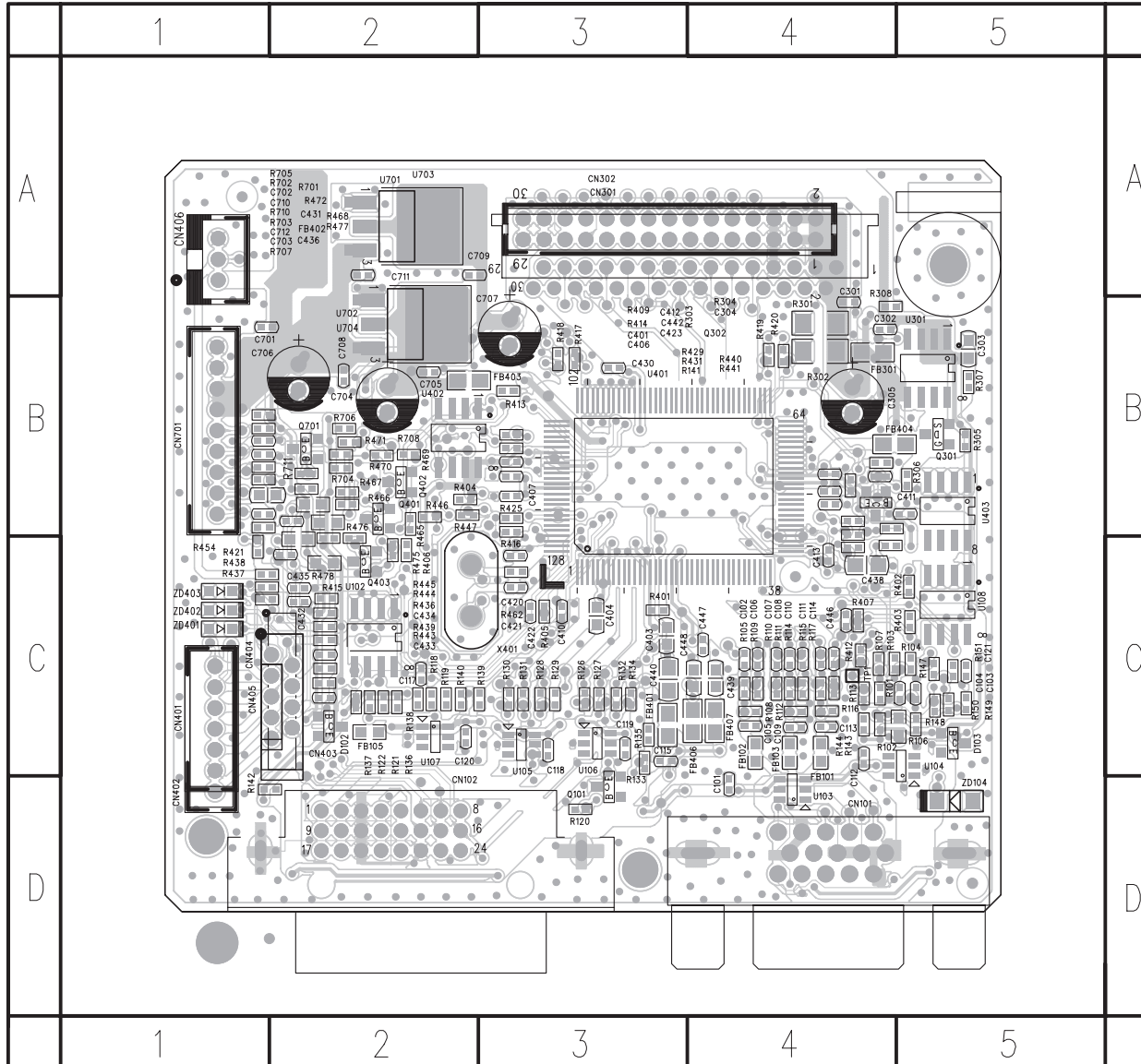
715G3016-1A



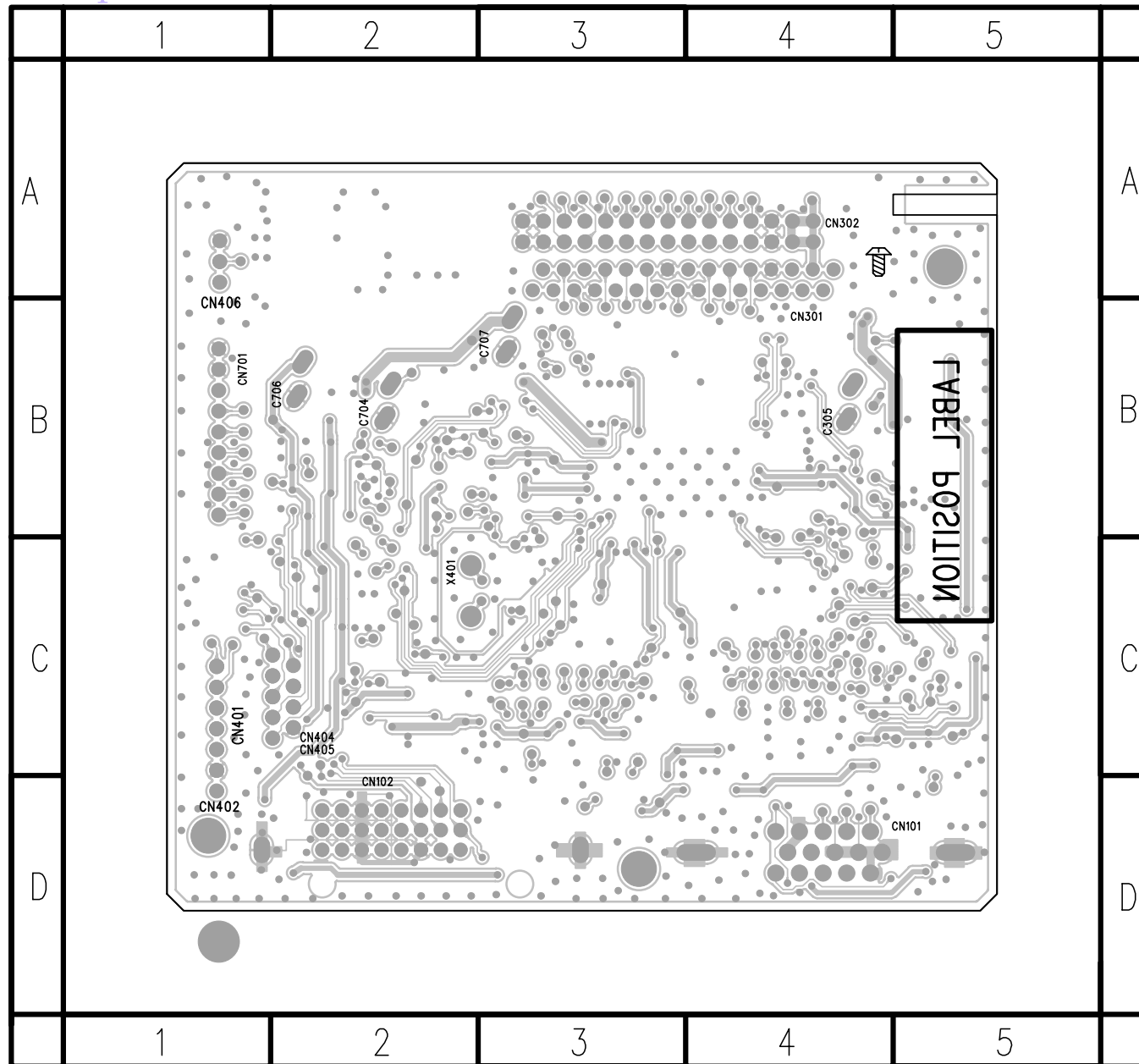
## 7. PCB Layout

### 7.1 Main Board

715G3226-1

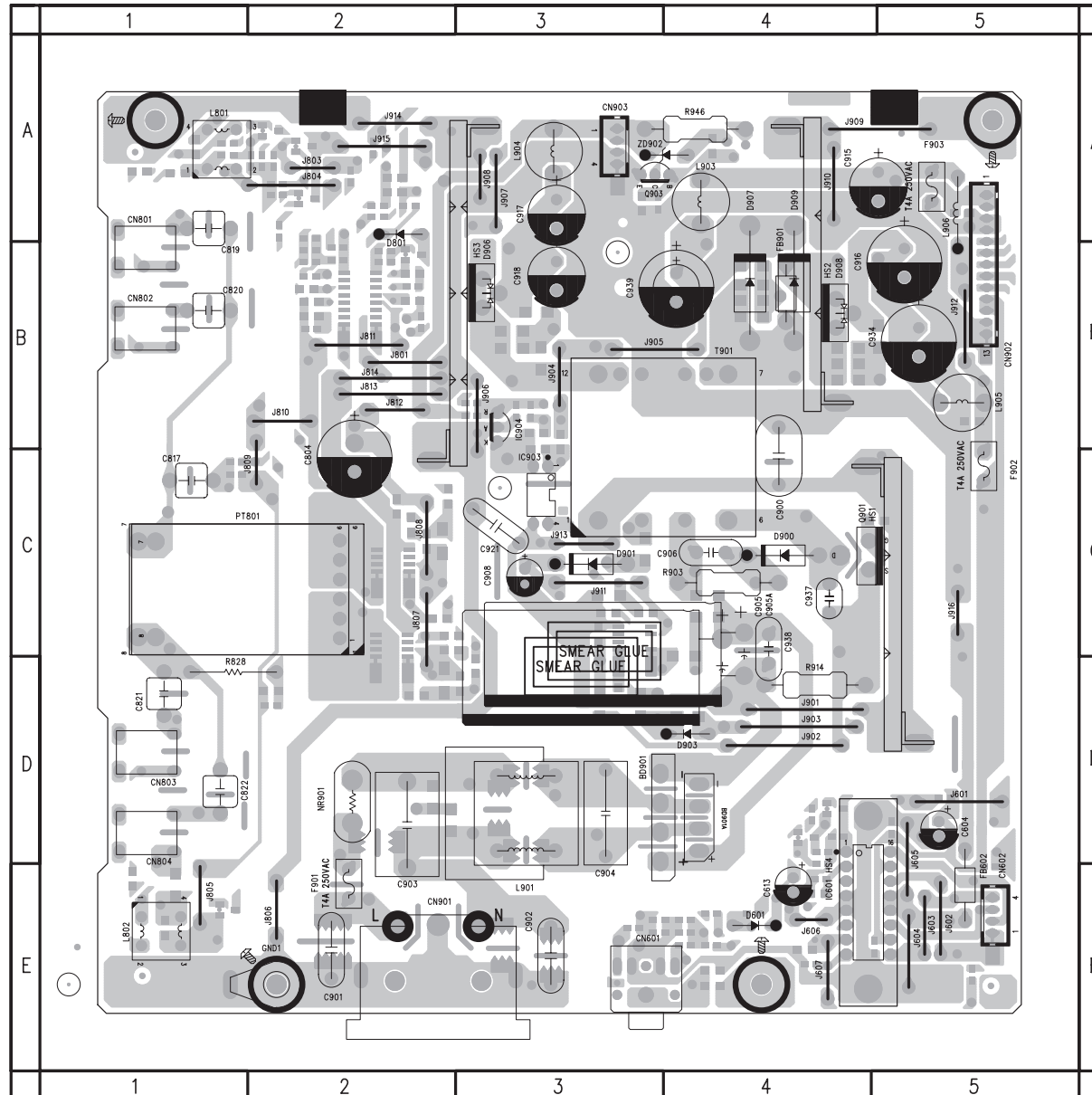


C101	D4	C438	C4	Q302	B4	R144	C4	R447	B2
C102	C4	C439	C4	Q401	B2	R147	C5	R454	C1
C103	C5	C440	C3	Q402	B2	R148	C5	R462	C3
C104	C5	C442	B4	Q403	C2	R149	C5	R465	B2
C105	C4	C446	C4	Q701	B2	R150	C5	R466	B2
C106	C4	C447	C4	R101	C4	R151	C5	R467	B2
C107	C4	C448	C4	R102	C5	R301	B4	R468	B2
C108	C4	C701	B2	R103	C4	R302	B4	R469	B2
C109	C4	C702	B1	R104	C5	R303	B4	R470	B2
C110	C4	C703	B2	R105	C4	R304	B4	R471	B2
C111	C4	C704	B2	R106	C5	R305	B5	R472	B2
C112	C4	C705	B2	R107	C4	R306	B5	R475	C2
C113	C4	C706	B2	R108	C4	R307	B5	R476	C2
C114	C4	C707	B3	R109	C4	R308	B4	R477	C2
C115	C3	C708	B2	R110	C4	R401	C3	R478	C2
C117	C2	C709	A2	R111	C4	R402	C5	R701	B2
C118	C3	C710	B1	R112	C4	R403	C5	R702	B1
C119	C3	C711	A2	R113	C4	R404	B2	R703	B2
C120	C2	C712	B1	R114	C4	R405	C3	R704	B2
C121	C5	CN101	D4	R115	C4	R406	C2	R705	B1
C301	B4	CN102	D2	R116	C4	R407	C4	R706	B2
C302	B4	CN301	A3	R117	C4	R409	B3	R707	B1
C303	B5	CN302	A3	R118	C2	R412	C4	R708	B2
C304	B4	CN401	C1	R119	C2	R413	B3	R710	B2
C305	B4	CN402	C1	R120	D3	R414	B3	R711	B2
C401	B3	CN403	C2	R121	C2	R415	C2	U102	C2
C403	C3	CN404	C2	R122	C2	R416	B3	U103	D4
C404	C3	CN405	C2	R126	C3	R417	B3	U104	C5
C406	B3	CN406	A1	R127	C3	R418	B3	U105	C3
C407	B3	CN701	B1	R128	C3	R419	B4	U106	C3
C410	C3	D102	C2	R129	C3	R420	B4	U107	C2
C411	B5	D103	C5	R130	C3	R421	C1	U108	C5
C412	B4	FB101	C4	R131	C3	R425	B3	U301	B5
C413	C4	FB102	C4	R132	C3	R429	B4	U401	B3
C420	C3	FB103	C4	R133	C3	R431	B4	U402	B3
C421	C3	FB105	C2	R134	C3	R436	C2	U403	B5
C422	C3	FB301	B4	R135	C3	R437	C2	U701	A2
C423	B4	FB401	C3	R136	C2	R438	C2	U702	B2
C430	B3	FB402	C2	R137	C2	R439	C2	U703	A2
C431	B2	FB403	B2	R138	C2	R440	B5	U704	B2
C432	C2	FB404	B5	R139	C3	R441	C5	X401	C2
C433	C2	FB406	C4	R140	C2	R443	C2	ZD104	D5
C434	C2	FB407	C4	R141	C4	R444	C2	ZD401	C1
C435	C2	Q101	D3	R142	D2	R445	C2	ZD402	C1
C436	C2	Q301	B5	R143	C4	R446	B2	ZD403	C1



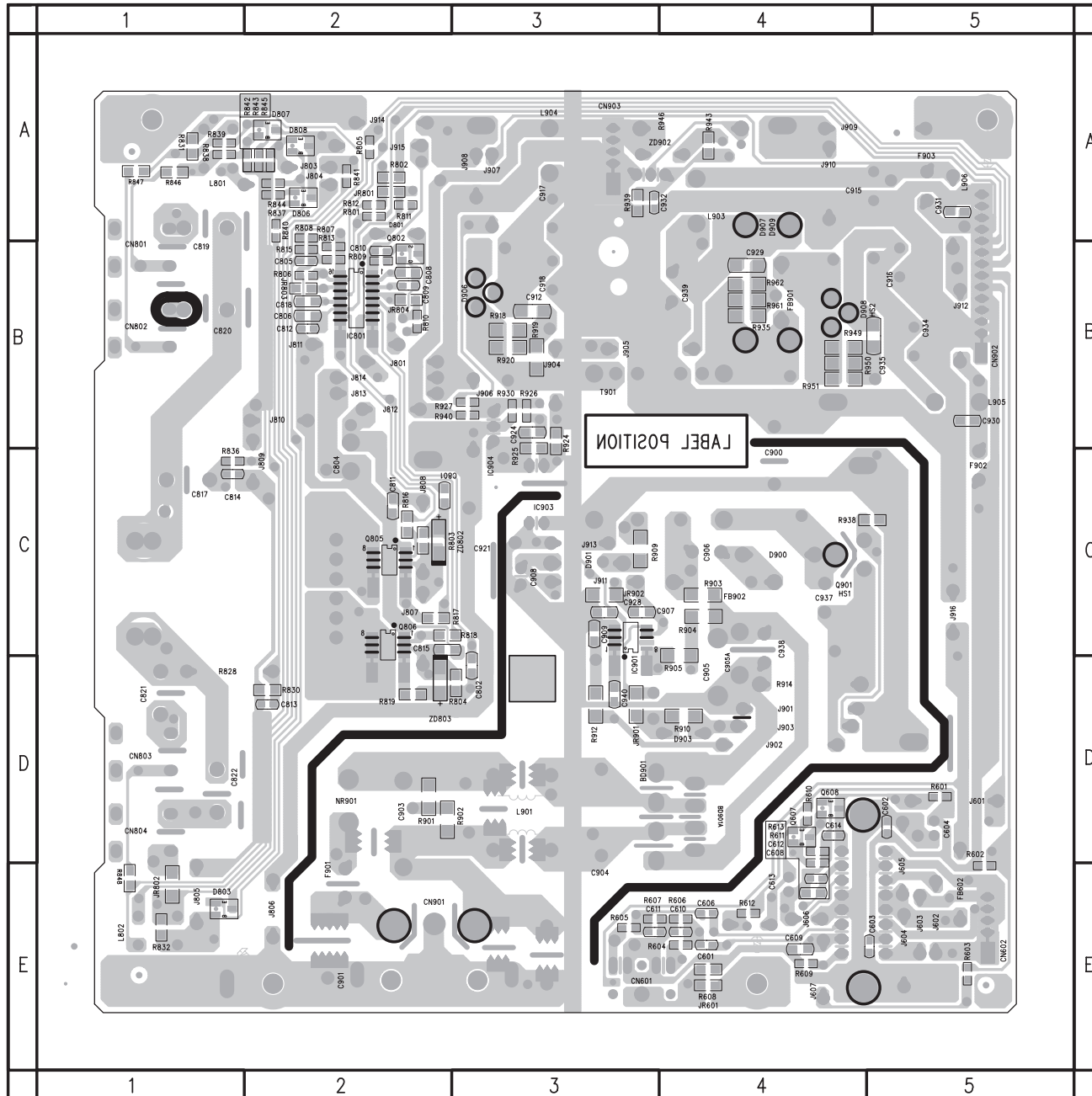
## 7.2 Power Board

715G2824-3-5



BD901	D3	CN903	A3	J812	B2
BD901A	D4	D601	D4	J813	B2
C604	D5	D801	A2	J814	B2
C613	D4	D900	C4	J901	C4
C804	B2	D901	C3	J902	C4
C817	B1	D903	C4	J903	C4
C819	A1	D906	A3	J904	B3
C820	B1	D907	A4	J905	B4
C821	C1	D908	B4	J906	B3
C822	C1	D909	A4	J907	A3
C900	B4	F901	D2	J908	A3
C901	D2	F902	B5	J909	A5
C902	D3	F903	A5	J910	A4
C903	D2	FB602	D5	J911	C3
C904	D3	FB901	A4	J912	B5
C905	C4	GND1	D2	J913	B3
C905A	C4	IC601	D4	J914	A2
C906	B4	IC903	B3	J915	A2
C908	C3	IC904	B3	J916	C5
C915	A5	J601	C5	L801	A1
C916	A5	J602	D5	L802	D1
C917	A3	J603	D5	L901	D3
C918	A3	J604	D5	L903	A4
C921	B3	J605	D5	L904	A3
C934	B5	J606	D4	L905	B5
C937	C4	J607	D4	L906	A5
C938	C4	J801	B2	NR901	C2
C939	A4	J803	A2	PT801	C2
CN601	D3	J804	A2	Q901	C5
CN602	D5	J805	D1	Q903	A3
CN801	A1	J806	D2	R828	C1
CN802	B1	J807	C2	R903	C4
CN803	C1	J808	B2	R914	C4
CN804	D1	J809	B2	R946	A4
CN901	D2	J810	B2	T901	B4
CN902	A5	J811	B2	ZD902	A3

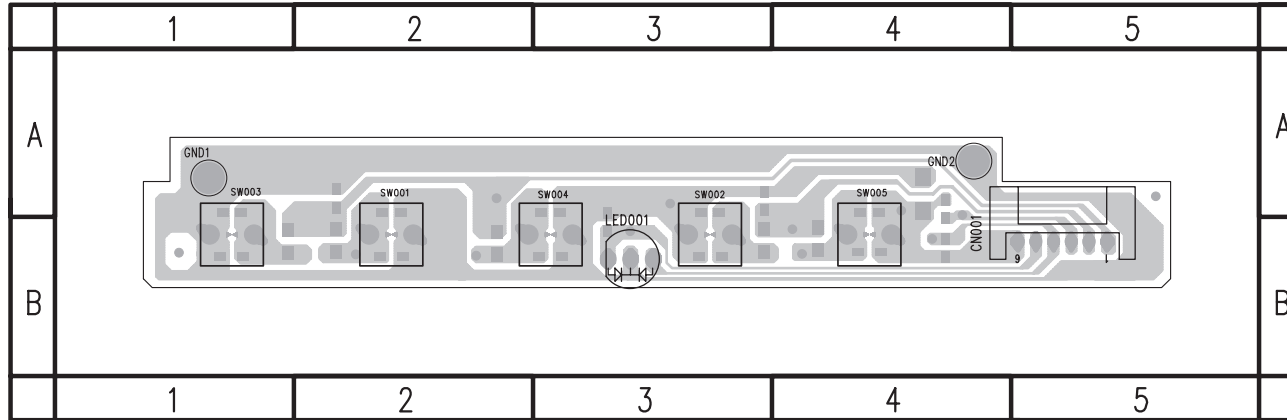




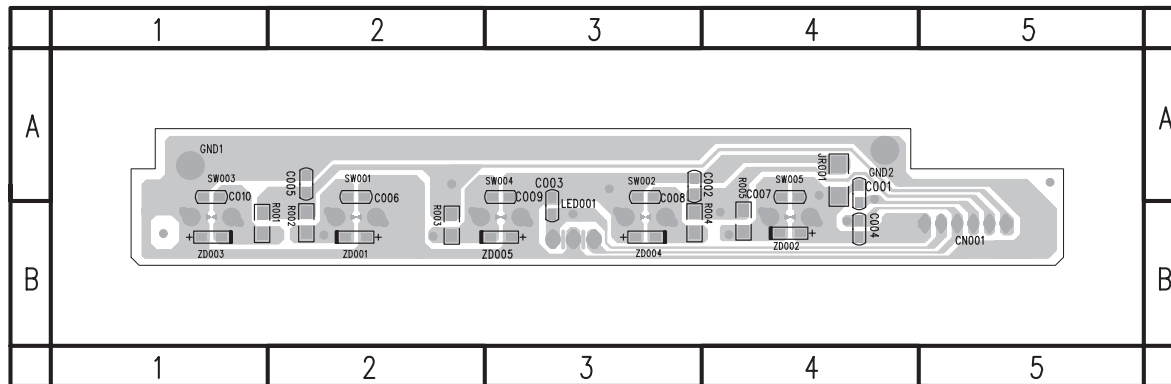
C601	D4	JR802	D1	R832	D1
C602	D5	JR803	A2	R836	B1
C603	D5	JR804	B2	R837	A2
C606	D4	JR901	C3	R838	A1
C608	D4	JR902	C3	R839	A1
C609	D4	Q607	D4	R840	A2
C610	D4	Q608	C4	R841	A2
C611	D3	Q802	A2	R842	A2
C612	D4	Q805	B2	R843	A2
C614	D4	Q806	C2	R844	A2
C801	B2	R601	C5	R845	A2
C802	C3	R602	D5	R846	A1
C805	A2	R603	D5	R847	A1
C806	B2	R604	D4	R848	D1
C808	A2	R605	D3	R901	C2
C809	A2	R606	D4	R902	D2
C810	A2	R607	D3	R904	C4
C811	B2	R608	D4	R905	C4
C812	B2	R609	D4	R909	B3
C813	C2	R610	D4	R910	C4
C814	B1	R611	D4	R912	C3
C815	C2	R612	D4	R918	B3
C818	B2	R613	D4	R919	B3
C907	C3	R801	A2	R920	B3
C909	C3	R802	A2	R924	B3
C912	B3	R803	B2	R925	B3
C924	B3	R804	C3	R926	B3
C928	C3	R805	A2	R927	B3
C929	A4	R806	A2	R930	B3
C930	B5	R807	A2	R935	B4
C931	A5	R808	A2	R938	B5
C932	A3	R809	A2	R939	A3
C935	B5	R810	B2	R940	B3
C940	C3	R811	A2	R943	A4
D803	D1	R812	A2	R949	B4
D806	A2	R813	A2	R950	B4
D807	A2	R815	A2	R951	B4
D808	A2	R816	B2	R961	B4
FB902	C4	R817	C2	R962	A4
IC801	A2	R818	C2	ZD802	B2
IC901	C3	R819	C2	ZD803	C2
JR601	D4	R830	C2		
JR801	A2	R831	A1		

### 7.3 Key Board

#### 715G3016-1A

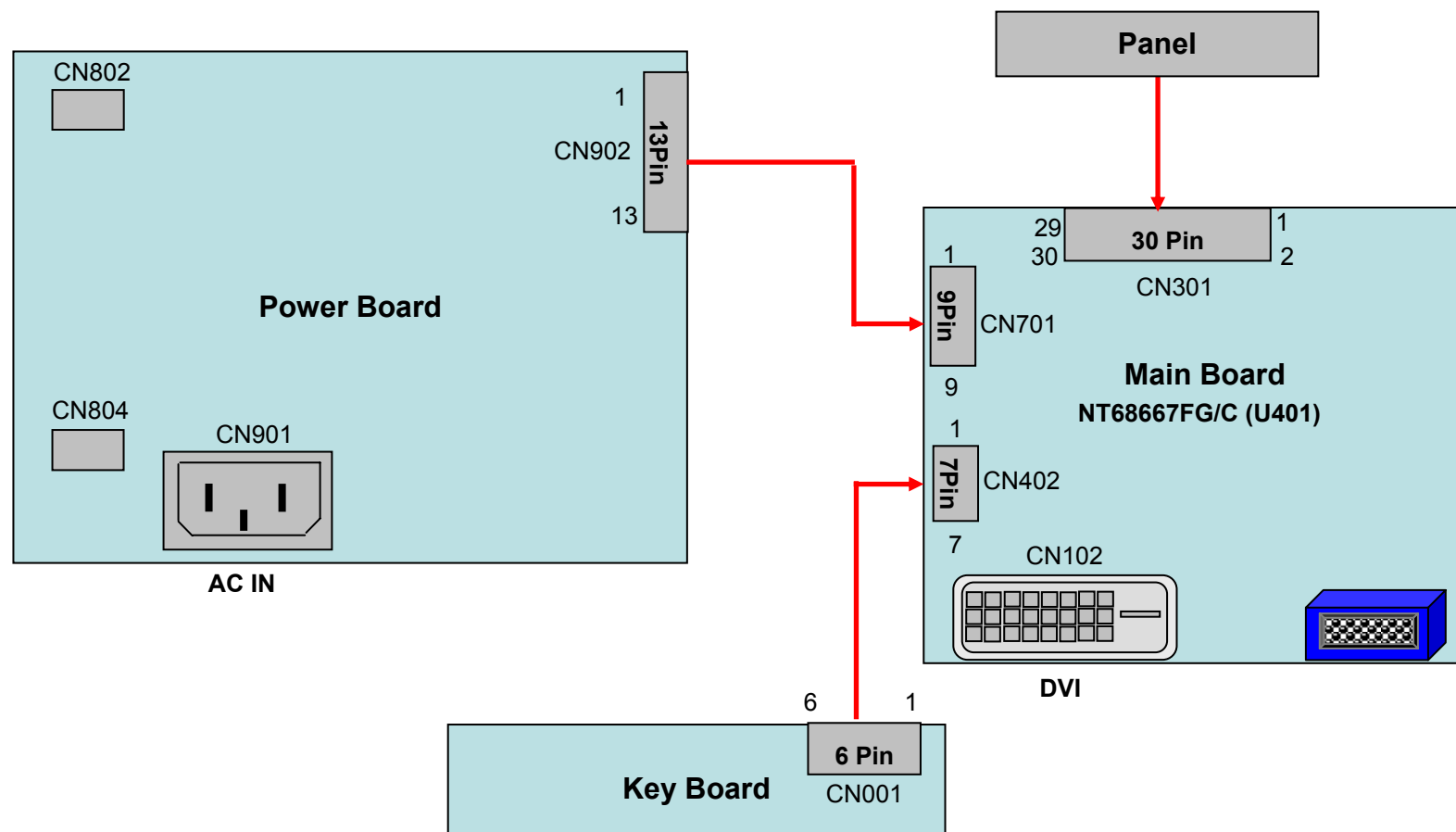


CN001	B5
LED001	B3
SW001	B2
SW002	B3
SW003	B1
SW004	B3
SW005	B4

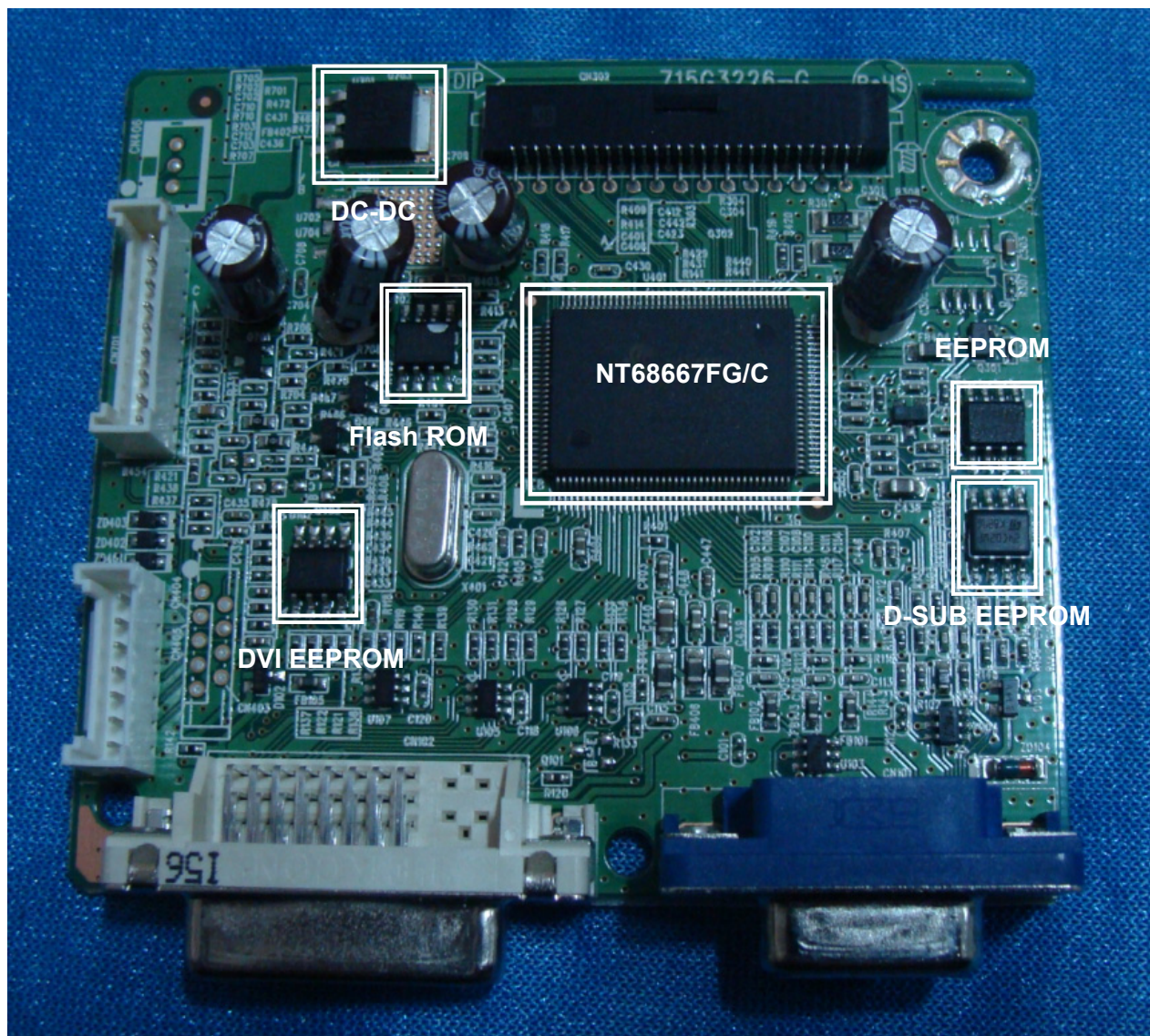


C001	A4	R001	B1
C002	A3	R002	B2
C003	B3	R003	B2
C004	B4	R004	B3
C005	A2	R005	B4
C006	A2	ZD001	B2
C007	A4	ZD002	B4
C008	A3	ZD003	B1
C009	A3	ZD004	B3
C010	A1	ZD005	B3

## 8. Wiring Diagram



## 9. Scalar Board Overview





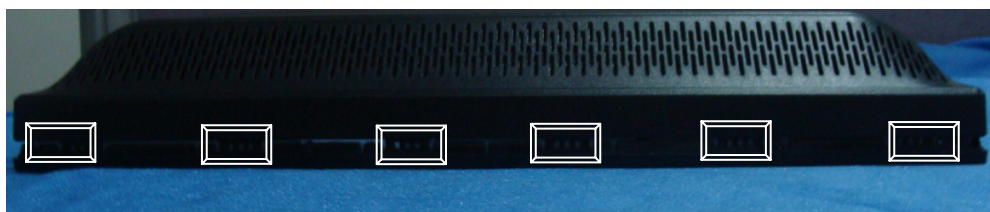
## 10. Mechanical Instructions

1. Place the monitor face down on a smooth surface, and release three screws to remove the stand-base ass'y.

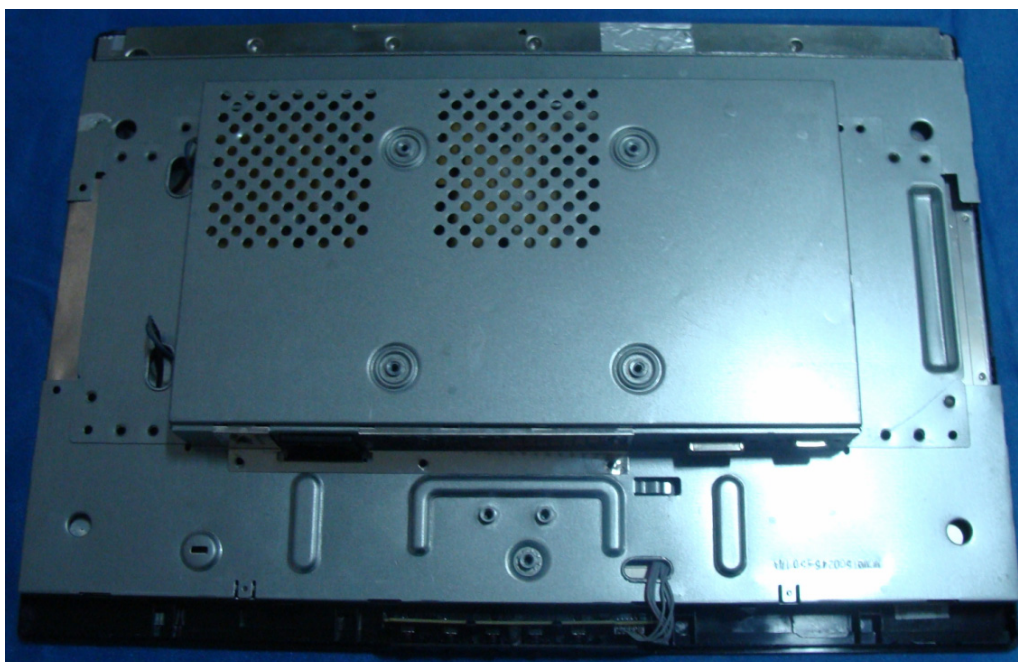
Note: Be careful to avoid scratch and injury during the process of uninstal.



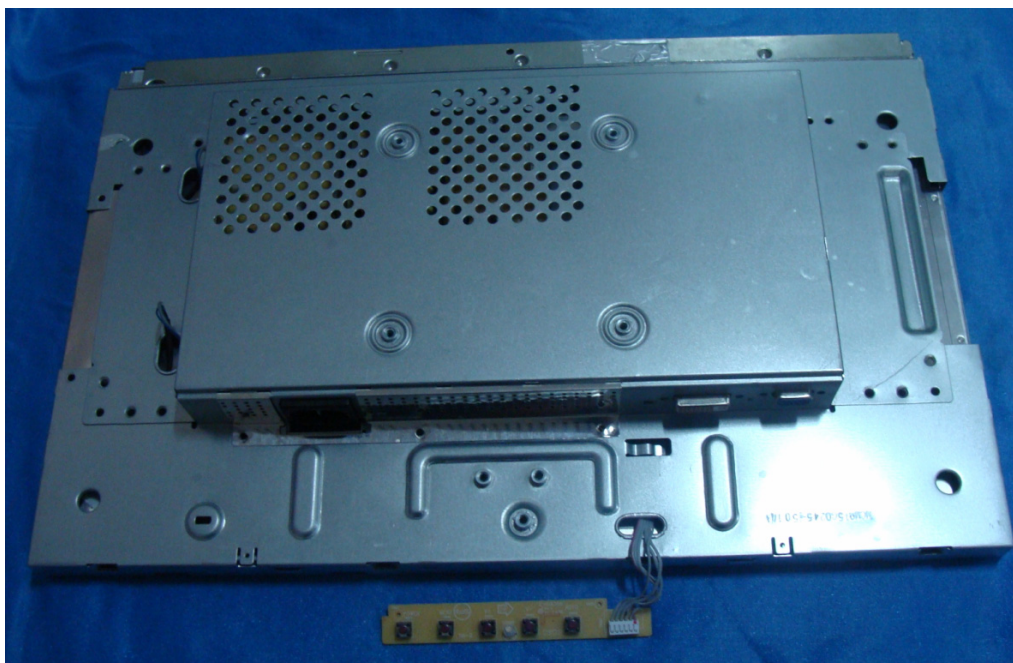
2. Use disassembly tool to open 6 latches at top of bezel as follow:



3. The 4 latches at bottom, 4 latches at left and 4 latches at right of bezel are opened with the same way, and then remove rear cover.

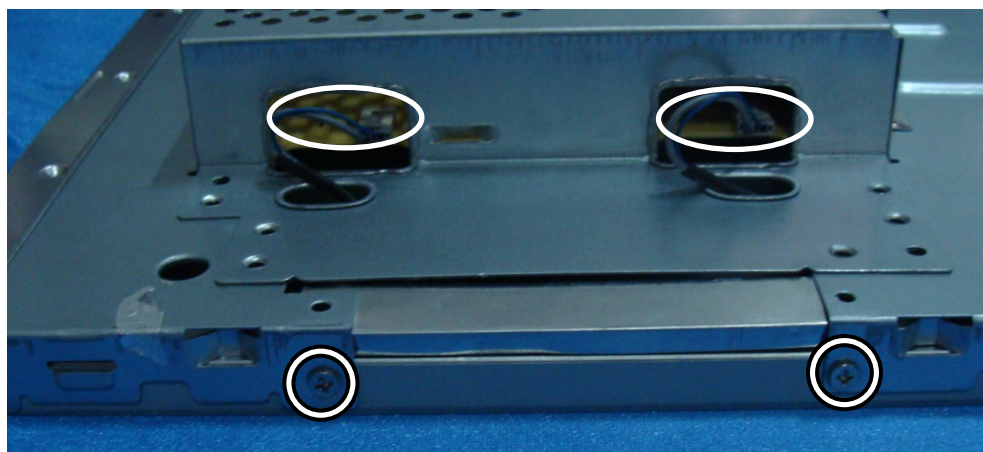


4. Remove the key board from the bezel and remove the bezel.



5. Remove main frame.

- A. Disconnect two connectors and four screws.





B. Press to release left and right latches of LVDS cable, and then disconnect it.

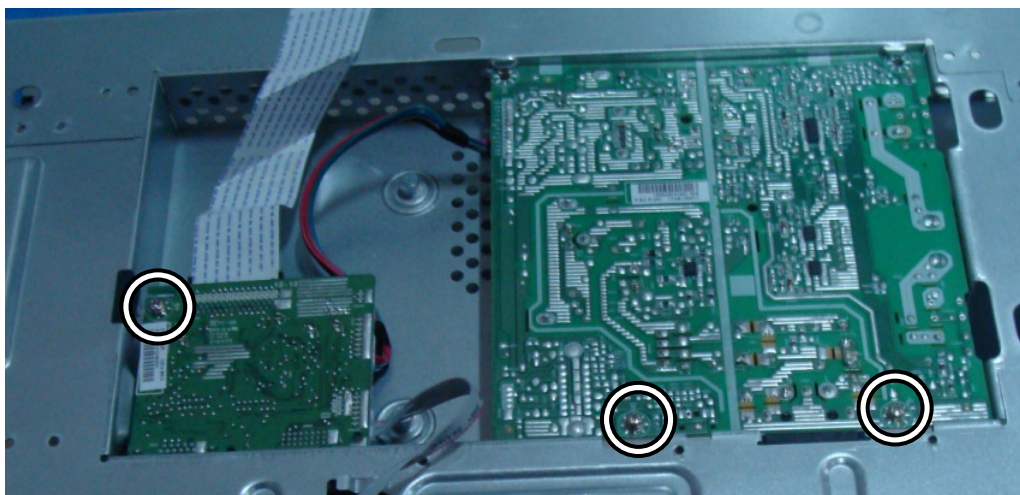


6. Remove Power Board and Main Board.

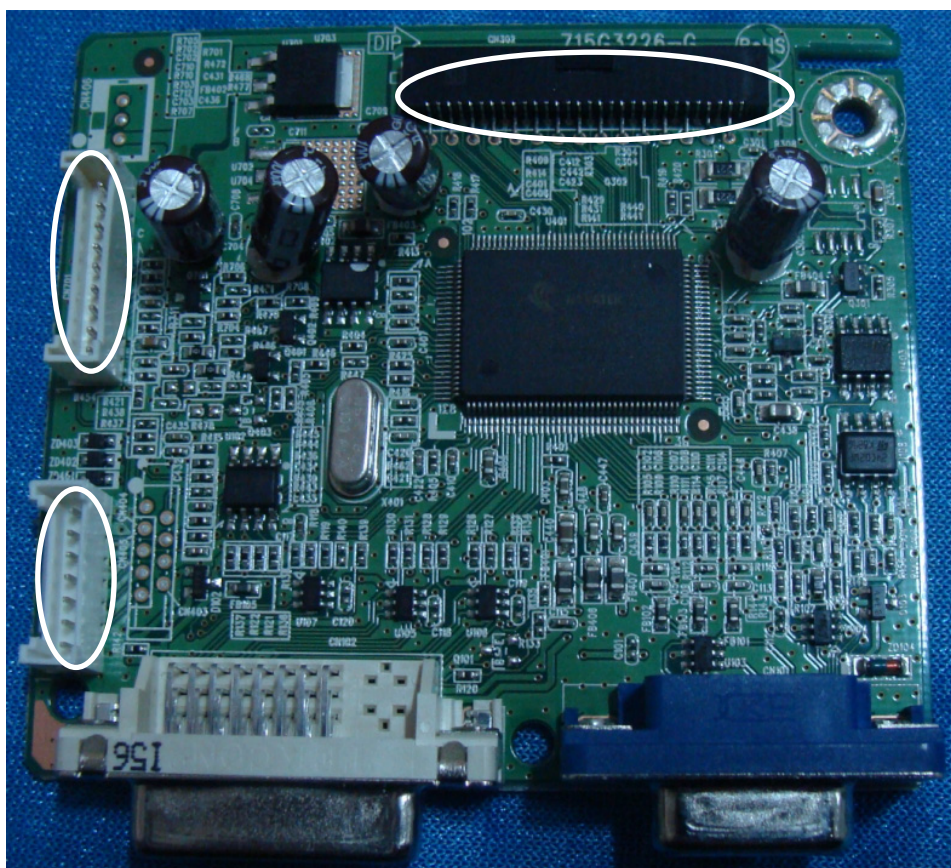
A. Remove four screws and mainframe.



B. Remove three screws to remove the Power Board and Main Board from mainframe.



C. Disconnect three connectors from Main Board.

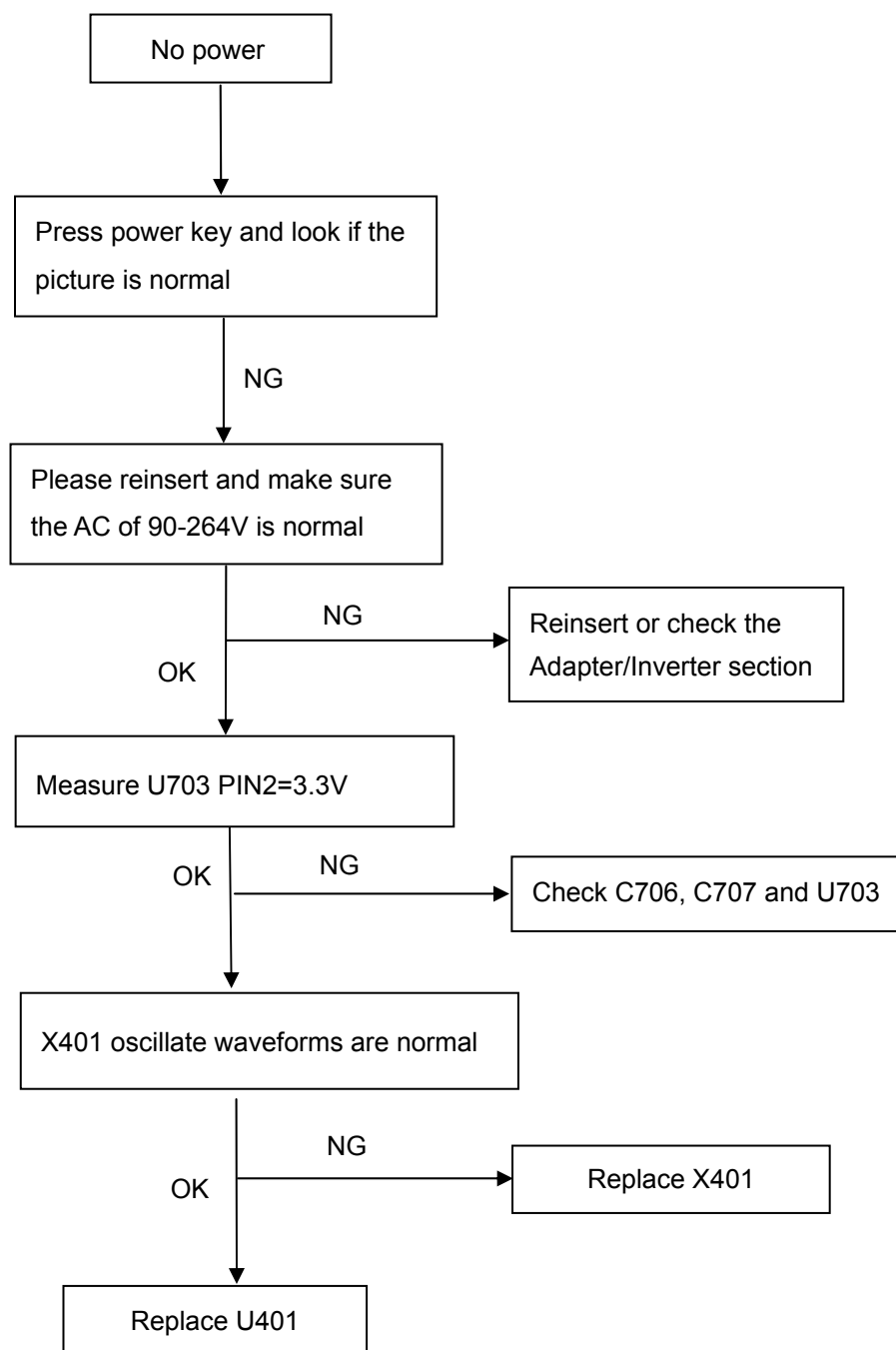




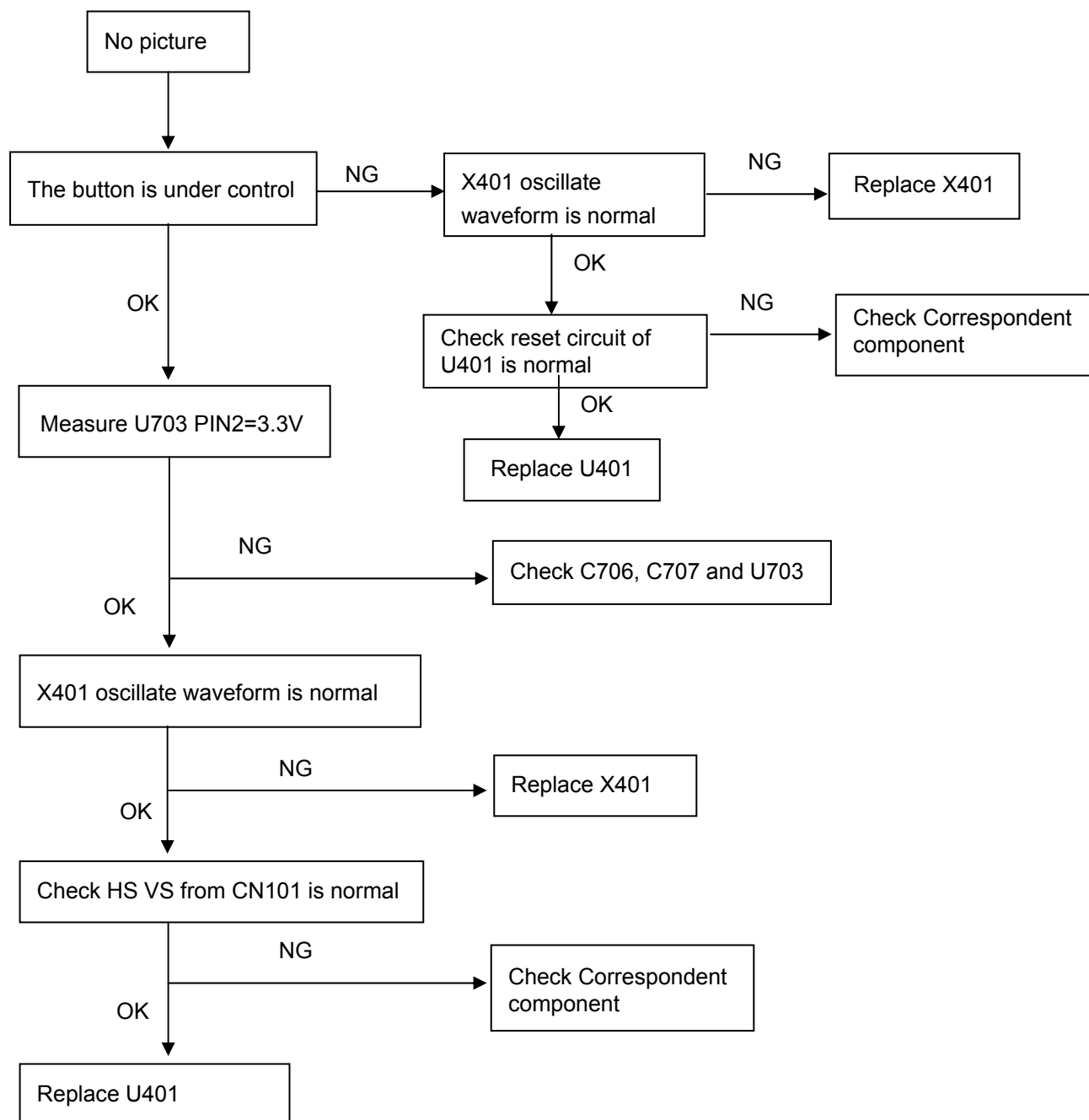
## 11. Repair Flow Chart

### 11.1 Main Board

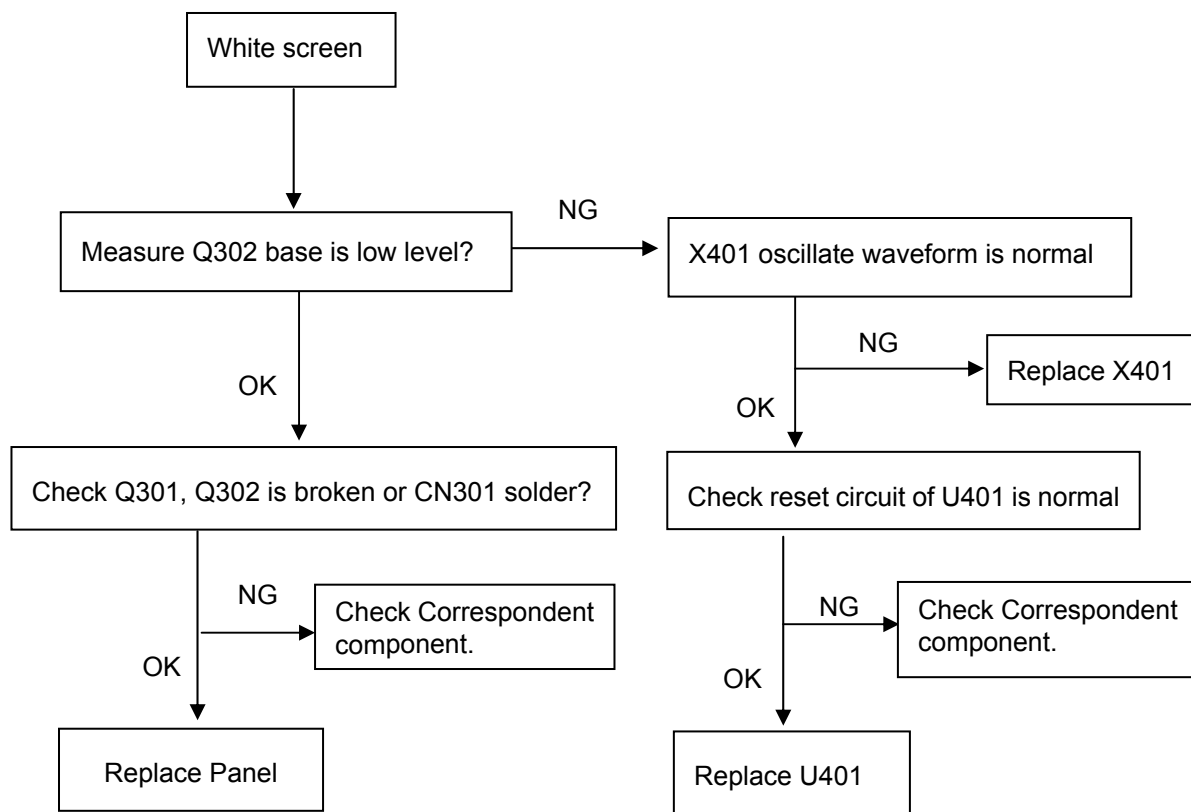
#### (1). No Power



(2). No Picture

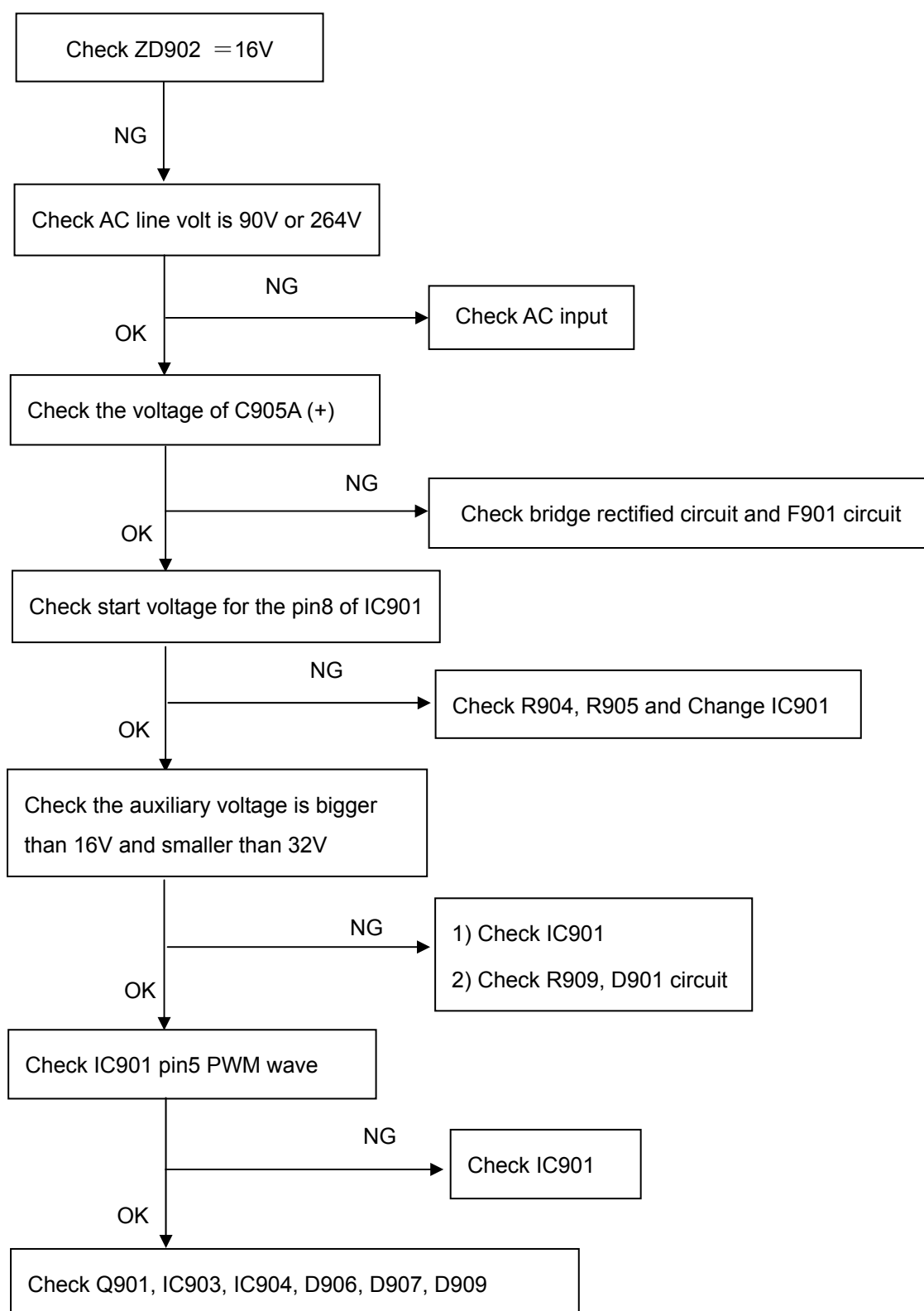


(3). White screen

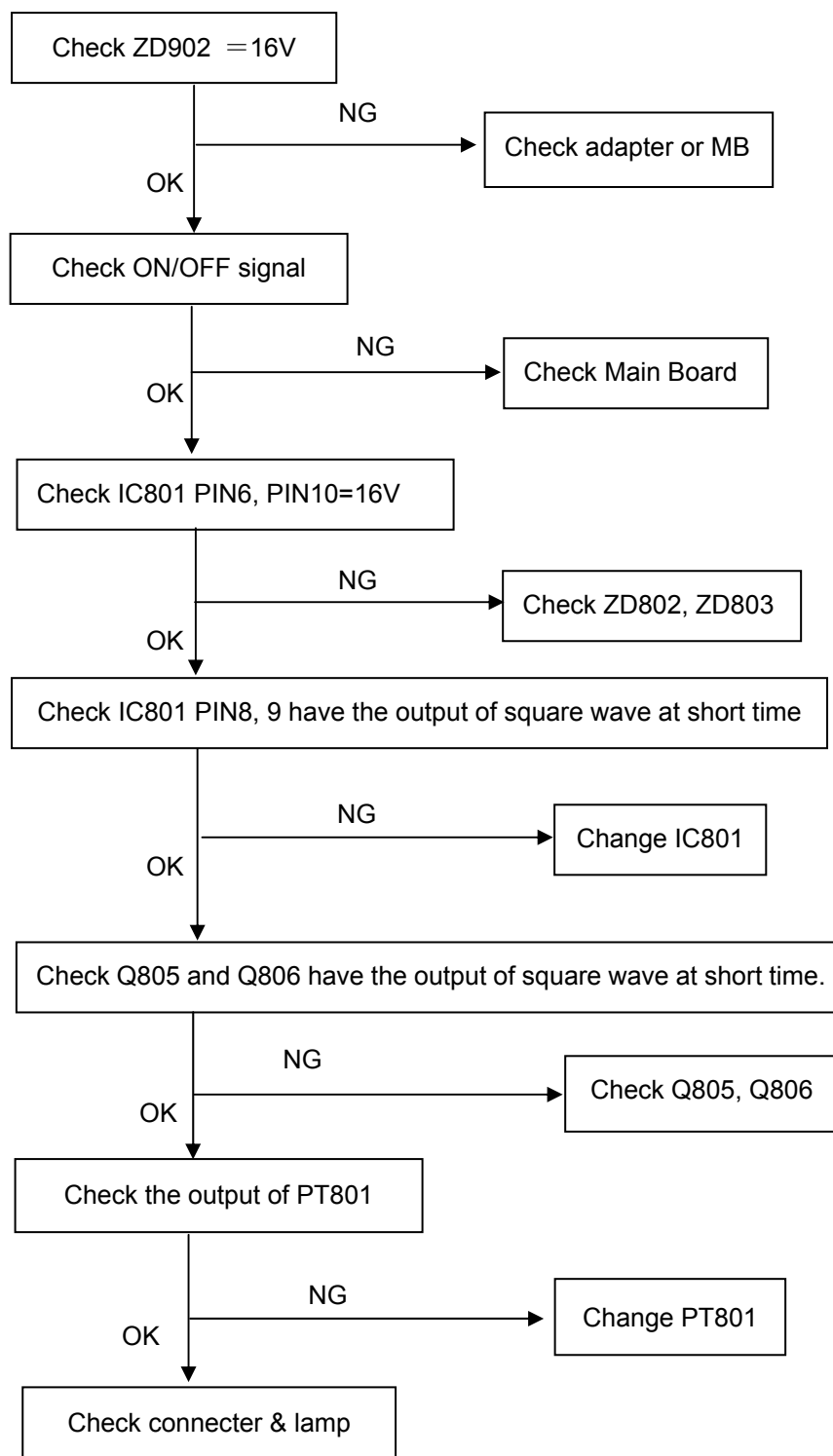


## 11.2. Power/Inverter Board

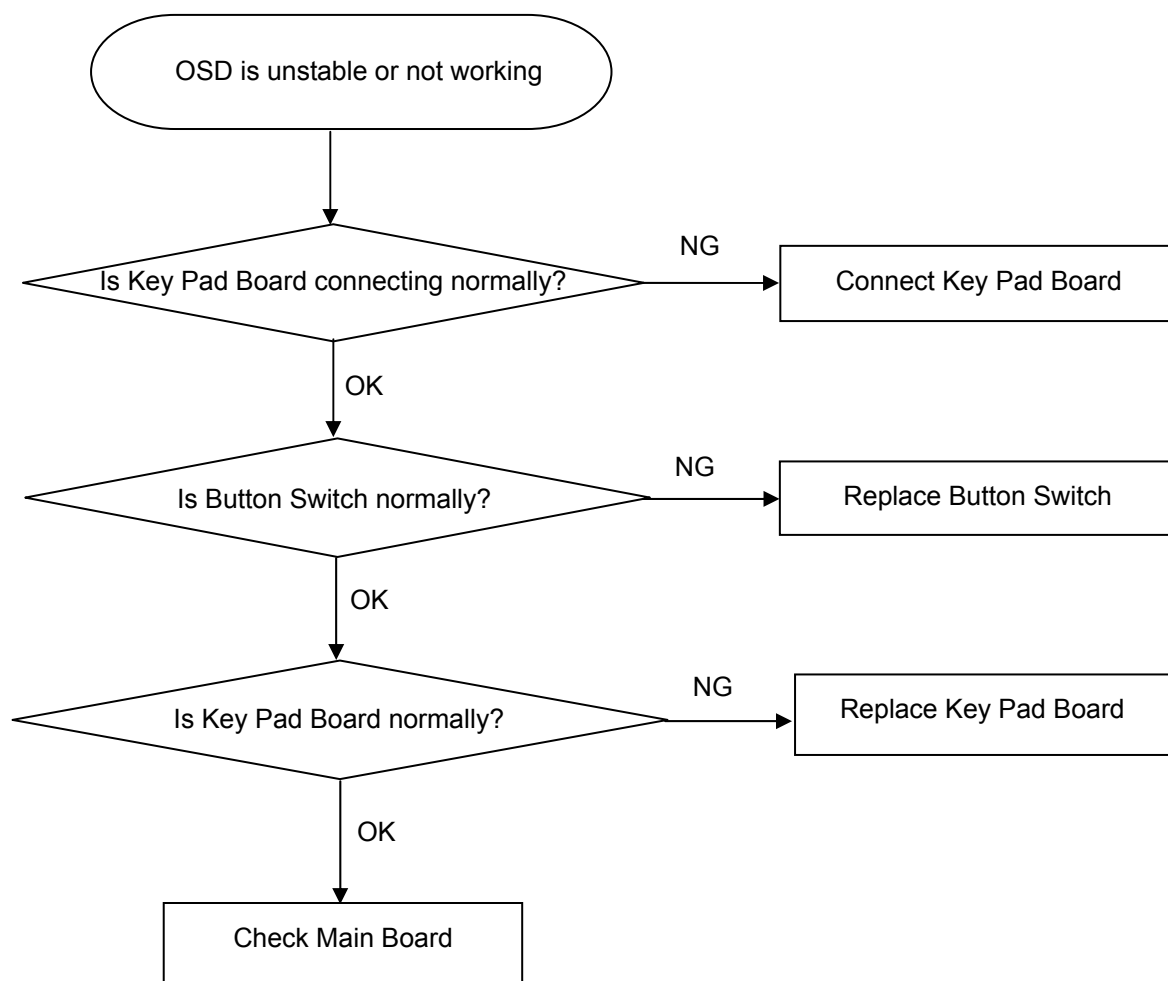
### (1) No power



(2) W / LED, No Backlight



### 11.3 Key Board



## 12. ISP Instruction

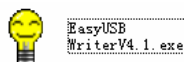
When do the parts, need the tools as follow:

- A. An i486 (or above) personal computer or compatible.
- B. Microsoft operation system Windows 95/98/2000/XP.
- C. "EasyUSB WriterV4.1" program
- D. Software ISP SN Alignment kits

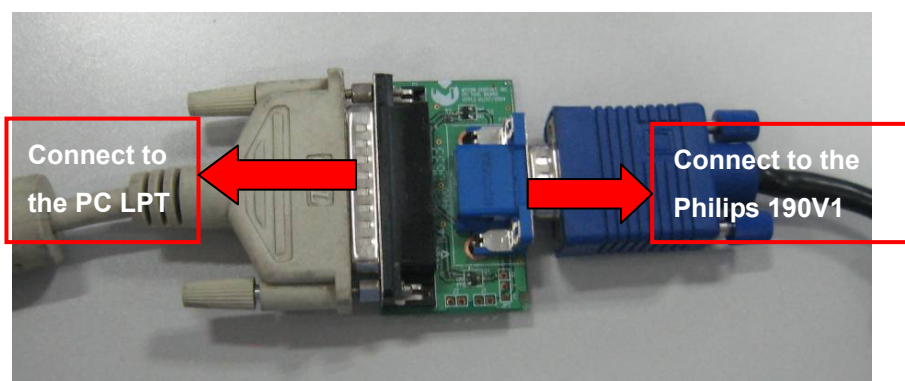
The kit contents:

- a. ISP BOARD x1
- b. Printer cablex1
- c. VGA cable x1

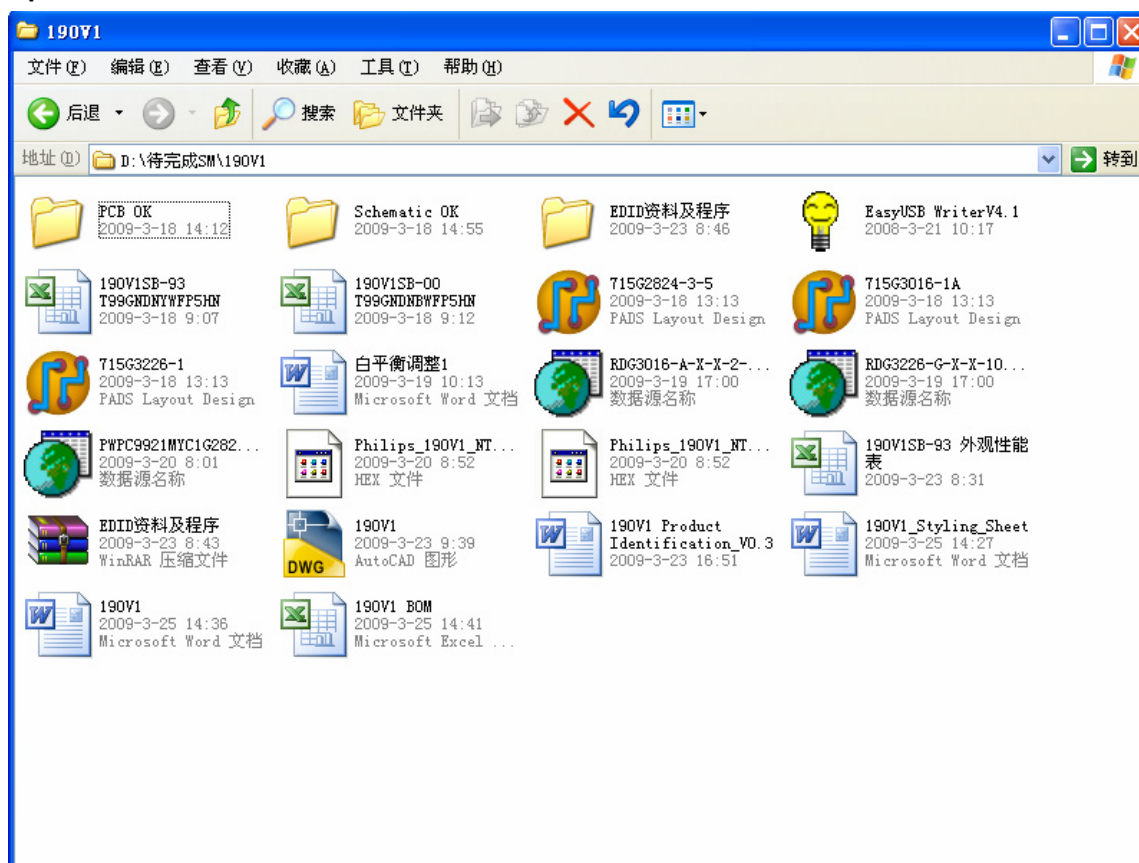
### 12.1 Install the "EasyUSB WriterV4.1"



### 12.2 Connect the ISP board as follow:



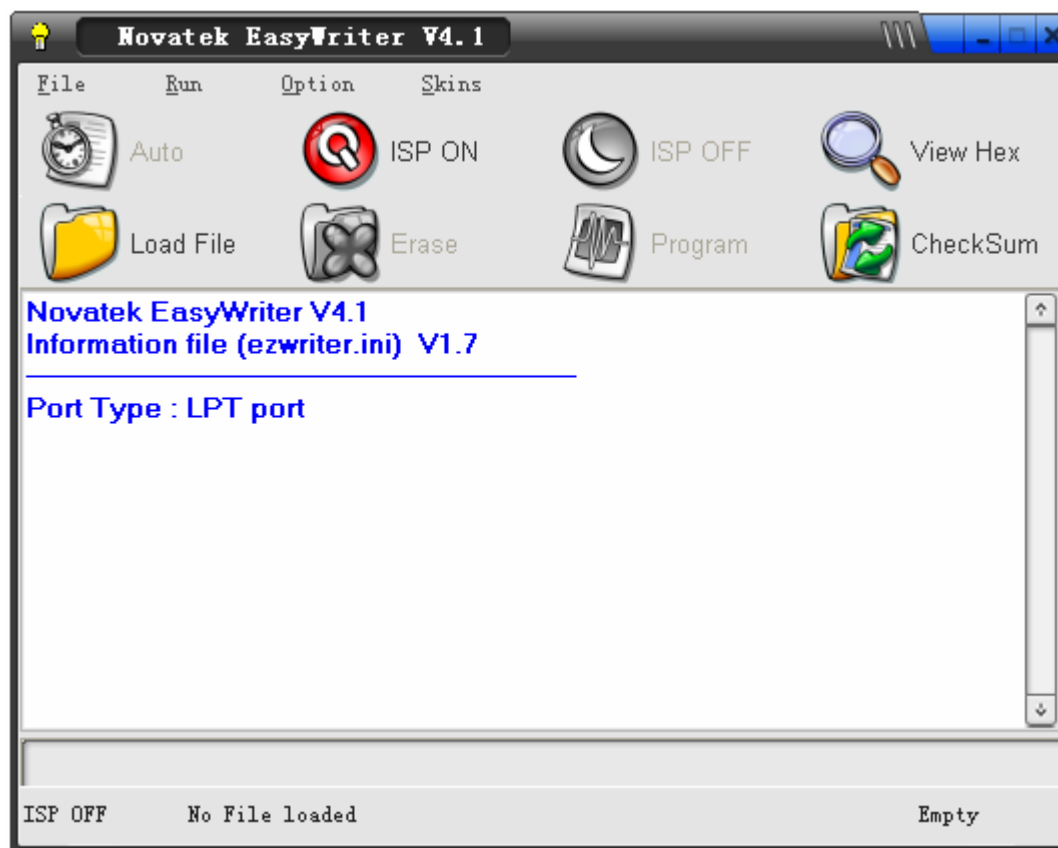
### 12.3 The process of ISP write is as follow:



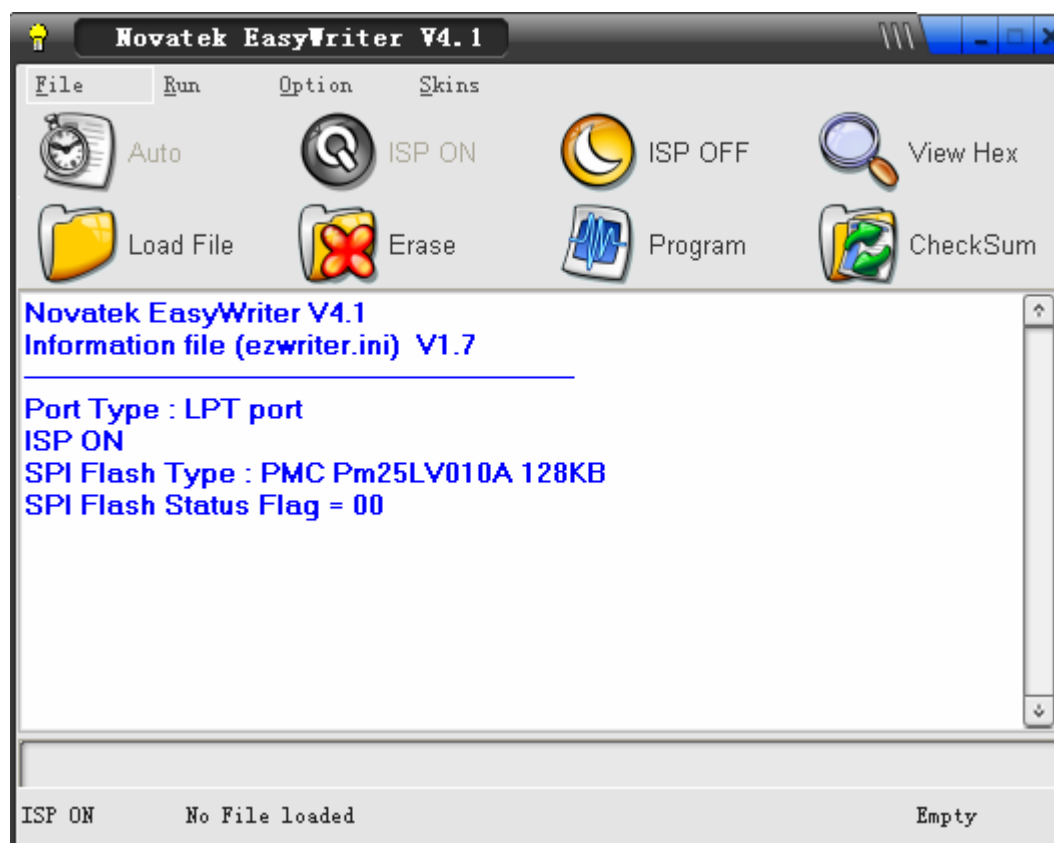


Writer  
EasyWriter  
Novatek

- a) Double-click , running the program as follows:

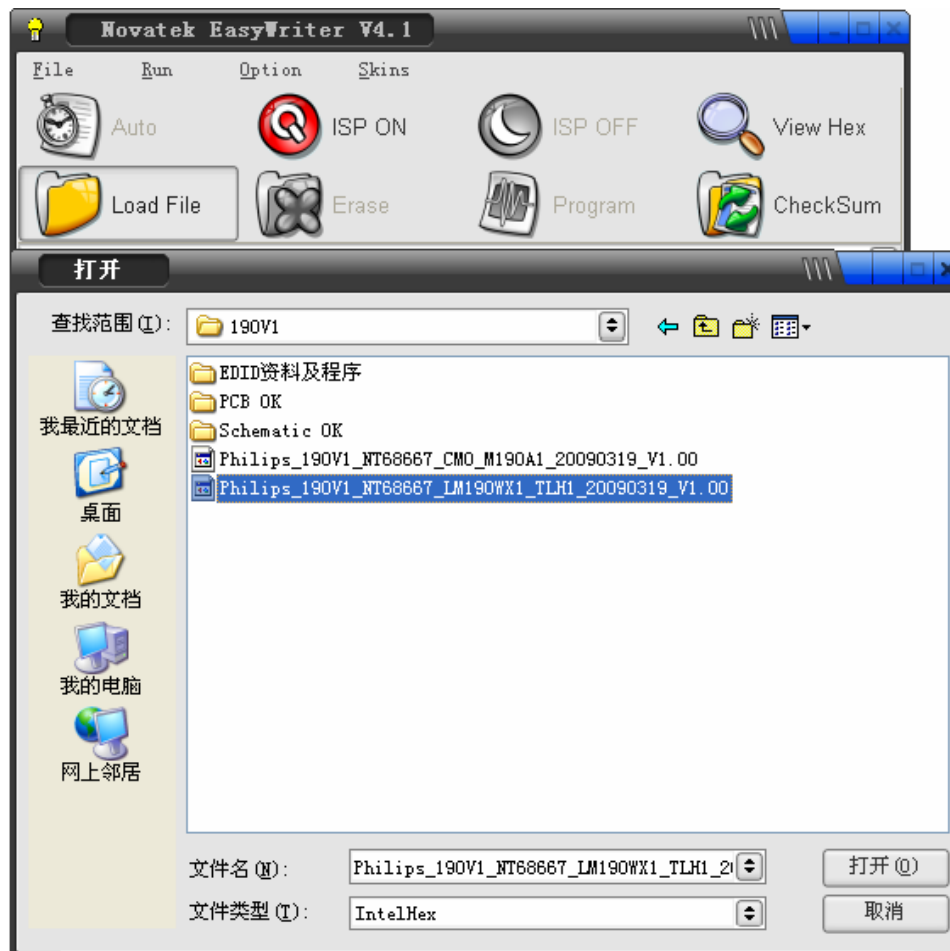


- b) Click icon and the program runs as follows:

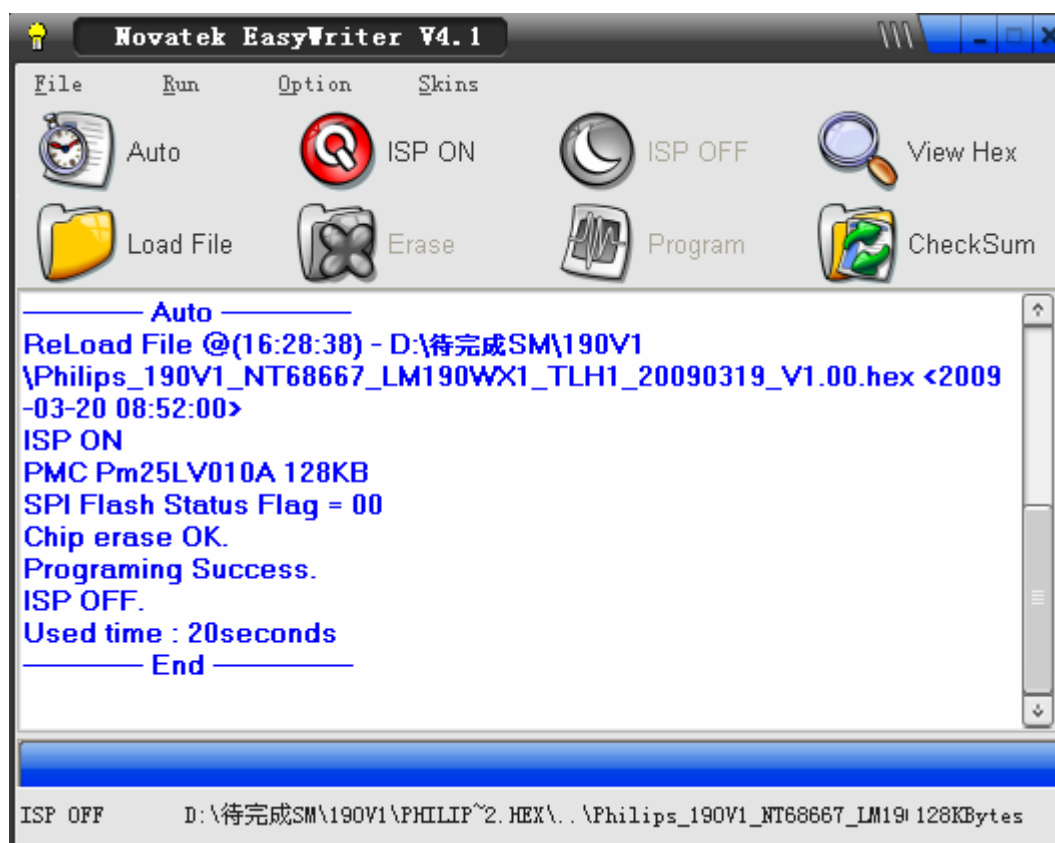




c) Click  icon, search the correct program and click open:



d) Click  icon. If it burns successfully, it will show as the follow picture:



## 13. DDC Instruction

### General

#### DDC Data Re-programming

In case the main EEPROM with Software DDC which store all factory settings were replaced because a defect, repaired monitor' the serial numbers have to be re-programmed.

It is advised to re- soldered the main EEPROM with Software DDC from the old board onto the new board if circuit board have been replaced, in this case the DDC data does not need to be re-programmed.

Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA). Extended Display Identification Data (EDID) information may be also obtained from VESA.

1. An i486 (or above) personal computer or compatible.
2. Microsoft operation system Windows 95/98/2000/XP.
3. "PORT95NT.exe, TPVDDC5.6.exe" program.
4. Software OSD SN Alignment kits

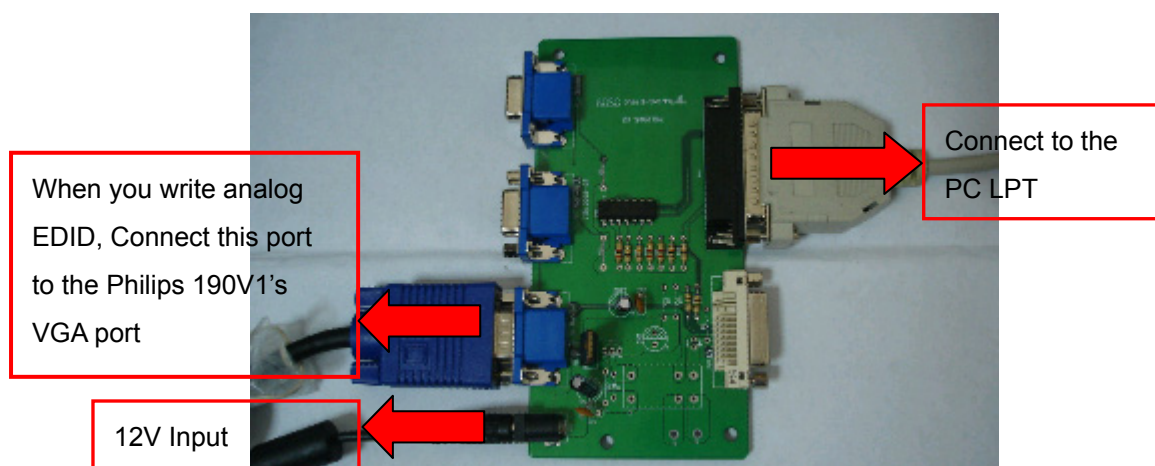
The kit contents:

- a. OSD SN BOARD x1
- b. Printer cablex1
- c. VGA cable x 1
- d. 12V DC power source

#### 13.1. Install the "PORT95NT.EXE", and restart the computer.

The process of installing "PORT95NT" has been specified in, so it will not be specified again. If you have any problem, please read it.

#### 13.2 Connect the DDC Board as follow:



### 13.3 The process of ISP write is as follow:

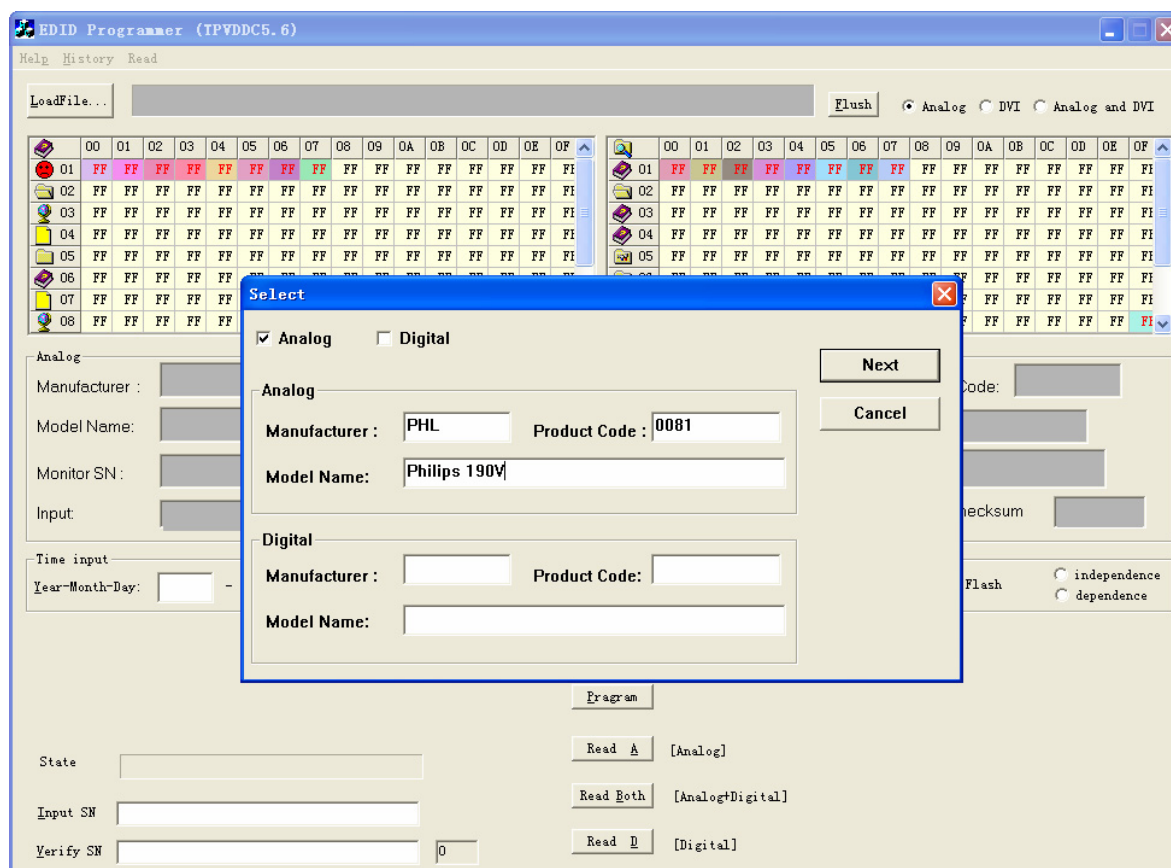


TPVDDC5.6.exe  
WinDDC  
TPV

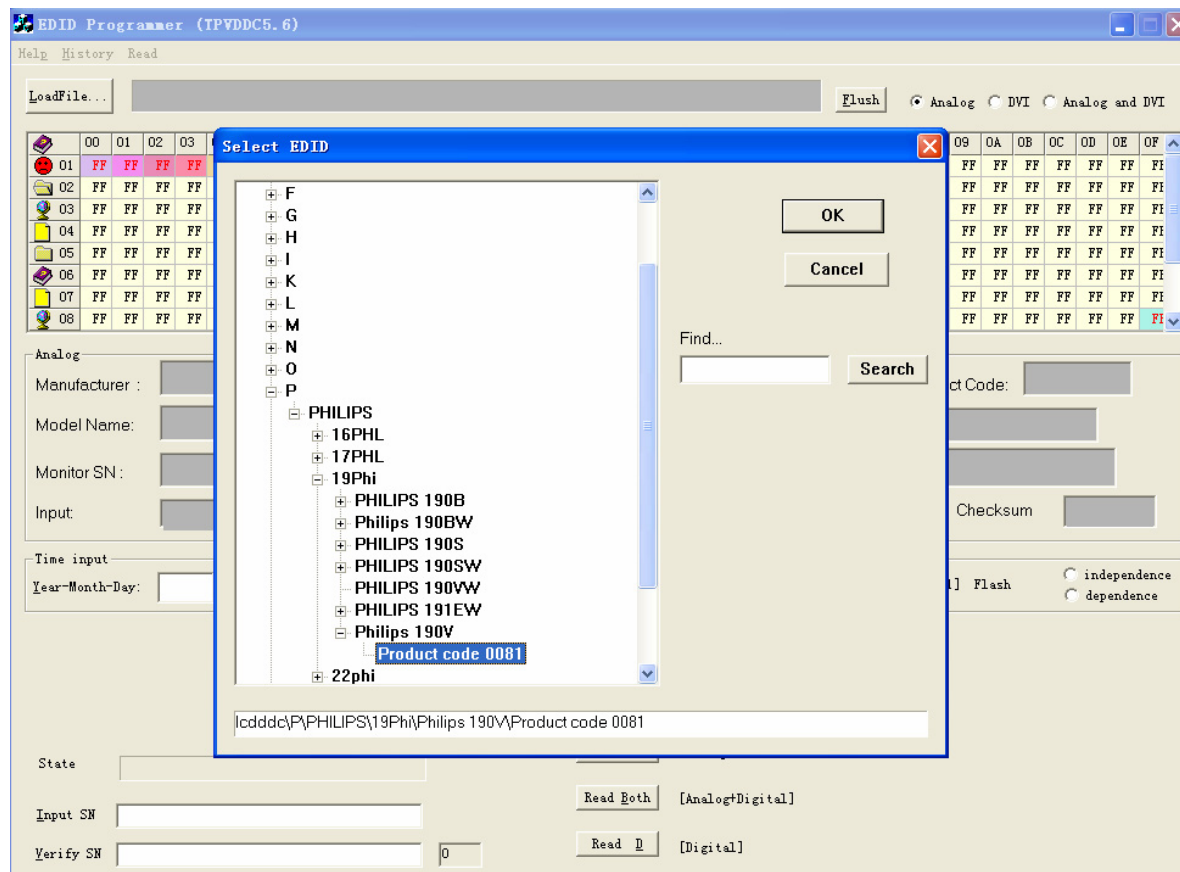
a. Double-click , appear as follow:

b. Choose “Analog” and then click “Loadfile”, it will show the picture as follow:

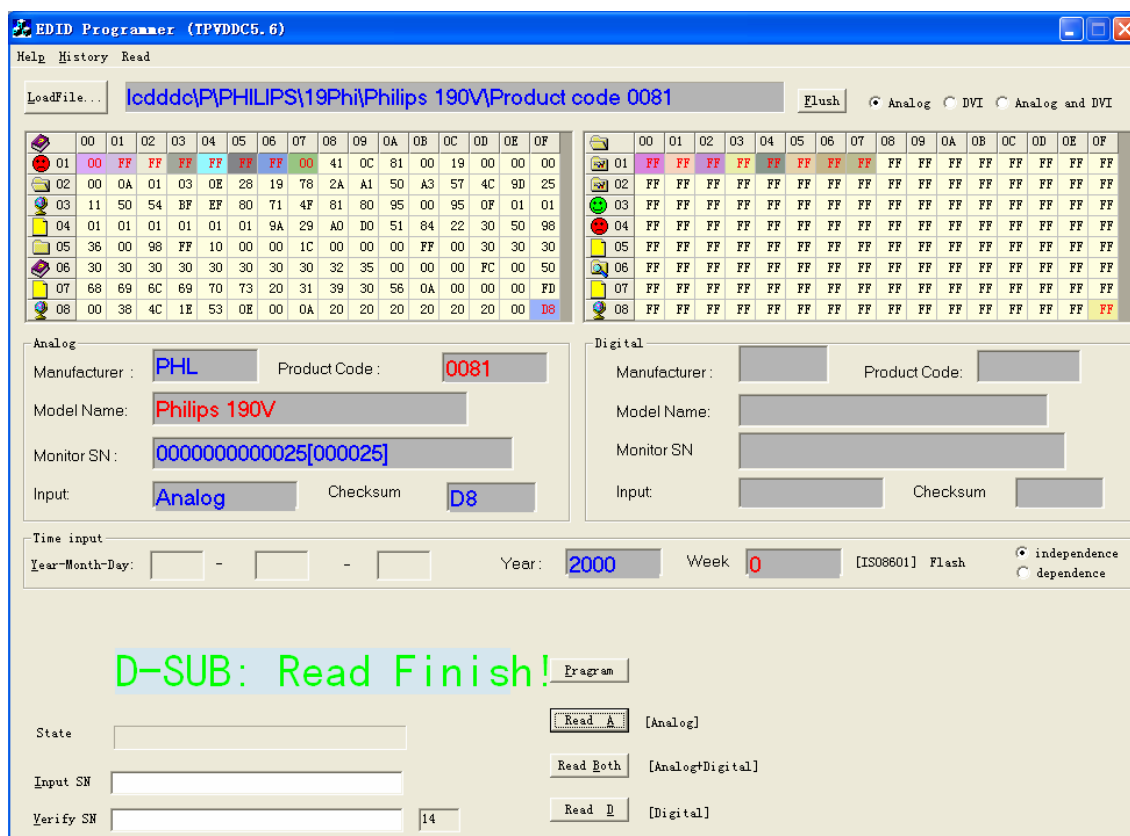
c. Input the information of the analog, it will show the picture as follow:



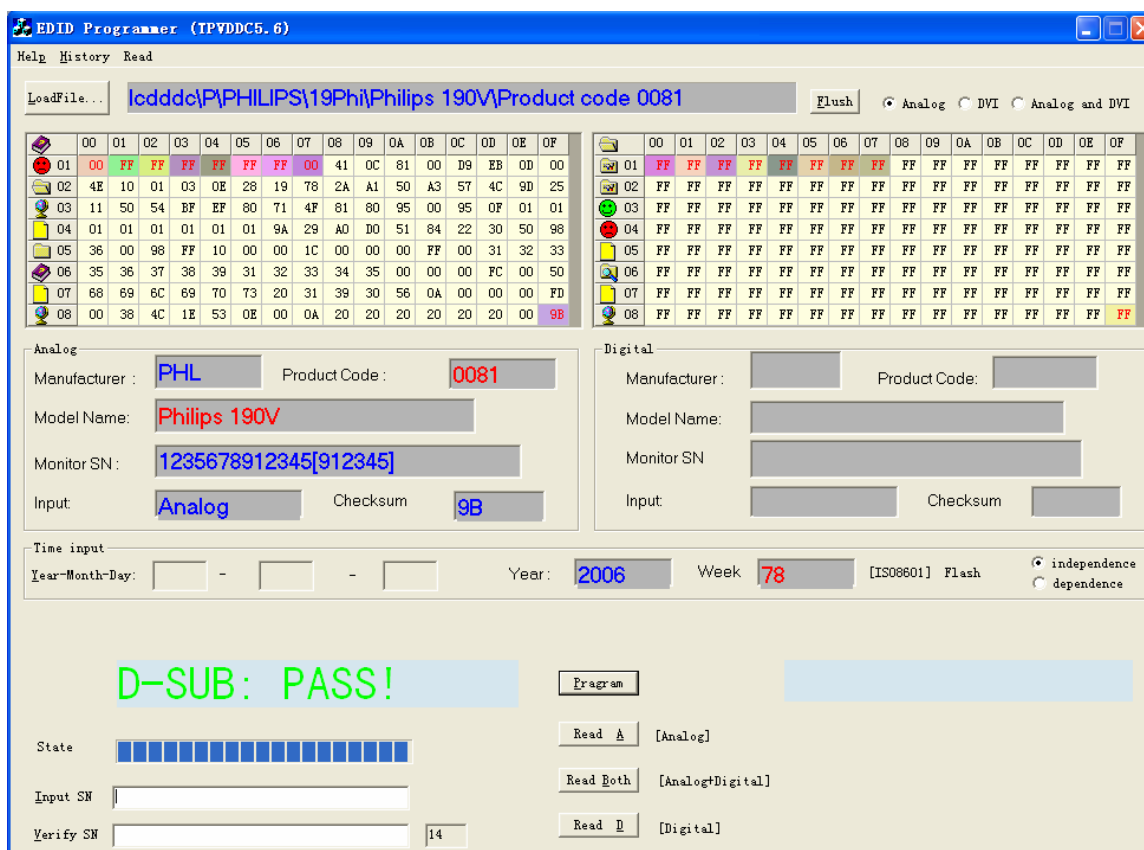
d. Click "OK", and choose the correct file.



e. Click "OK", and then click "Read A", it will show the picture as follow:



f. Key in the same 14 numbers in the Input SN and Verify SN, then click "Program", when the analog DDC Write complete, it will show the picture as follow:



**Note:**

The way of digital DDC Write is the same as analog.

## 190V1 EDID

### Analog

1128 bytes EDID Data (Hex):

00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15

0: 00 FF FF FF FF FF FF 00 41 0C 81 00 E9 D9 01 00  
16: 20 0B 01 03 0E 28 19 78 2A A1 50 A3 57 4C 9D 25  
32: 11 50 54 BF EF 80 71 4F 81 80 95 00 95 0F 01 01  
48: 01 01 01 01 01 01 9A 29 A0 D0 51 84 22 30 50 98  
64: 36 00 98 FF 10 00 00 1C 00 00 00 FF 00 32 33 31  
80: 33 31 33 32 31 32 31 33 32 31 00 00 00 FC 00 50  
96: 68 69 6C 69 70 73 20 31 39 30 56 0A 00 00 00 FD  
112: 00 38 4C 1E 53 0E 00 0A 20 20 20 20 20 20 00 FB

### Decoded EDID data

<---Header--->

Header: 00 FF FF FF FF FF FF 00

<-x-Header-x->

<---Vendor/Product Identification--->

ID Manufacturer Name: PHL  
ID Product Code: 0081  
ID Serial Number: 0001d9e9  
Week of Manufacture: 32  
Year of Manufacture: 2001

<-x-Vendor/Product Identification-x->

<---EDID Structure Version/Revision--->

EDID Version#: 01  
EDID Revision#: 03

<-x-EDID Structure Version/Revision-x->

<---Basic Display Parameters/Features--->

Video i/p definition: Analog  
Signal Level Standard: 0.700V/0.300V(0.700Vpp)  
Setup: Blank-to-Black not expected

Separate Sync Support: Yes

Composite Sync Support: Yes

Sync. on green video supported: Yes

Serration of the Vsync.Pulse is not required.

Max. H. Image Size : 40cm.

Max. V. Image Size : 25cm.

Display Gamma: 2.2

DPMS Features, Active off: Yes.

Display Type: R/G/B color display.

Preferred Timing Mode: Yes.

<---Basic Display Parameters/Features--->

<---Color Characteristics--->

Red x: 0.6386718750

Red y: 0.3417968750

Green x: 0.2968750000

Green y: 0.6142578125

Blue x: 0.1455078125

Blue y: 0.0673828125

White x: 0.3125000000

White y: 0.3291015625

<-x-Color Characteristics-x->

<---Established Timings--->

Established Timings 1: BF

-720x400 @70Hz VGA,IBM

-640x480 @60Hz VGA,IBM

-640x480 @67Hz Apple,Mac II

-640x480 @72Hz VESA

-640x480 @75Hz VESA

-800x600 @56Hz VESA

-800x600 @60Hz VESA

Established Timings 2: EF

-800x600 @72Hz VESA

-800x600 @75Hz VESA

-832x624 @75Hz Apple,Mac II

-1024x768 @60Hz VESA

-1024x768 @70Hz VESA

-1024x768 @75Hz VESA

-1280x1024 @75Hz VESA

Established Timings 3: 80

-1152x870 @75Hz Apple,Mac II



<-x-Established Timings-x->

<---Standard Timing Identification--->

-1152x864@75

-1280x1024 @60

-1440x900@60

-1440x900@75

<-x-Standard Timing Identification-x->

<---Detailed Timing Descriptions--->

Detailed Timing: 1440x900 @ 60Hz.

<-x-Detailed Timing Descriptions-x->

<---Detailed Timing Descriptions--->

Detailed Timing: FF (Monitor SN) '231313212132'

Detailed Timing: FC (Monitor Name) 'Philips 190V'

Detailed Timing: FD (Monitor limits)

Min. V. rate: 56Hz

Max. V. rate: 76Hz

Min. H. rate: 30KHz

Max. H. rate: 83KHz

Max. Pixel Clock: 140MHz

<-x-Detailed Timing Descriptions-x->

Extension Flag: 00

Checksum: FB



128 bytes EDID Data (Hex):

00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15

0: 00 FF FF FF FF FF FF 00 41 0C 81 00 29 E7 04 00  
16: 15 0D 01 03 80 28 19 78 2A A1 50 A3 57 4C 9D 25  
32: 11 50 54 BF EF 80 71 4F 81 80 95 00 95 0F 01 01  
48: 01 01 01 01 01 01 9A 29 A0 D0 51 84 22 30 50 98  
64: 36 00 98 FF 10 00 00 1C 00 00 00 FF 00 31 32 33  
80: 32 33 32 31 33 32 31 33 32 31 00 00 00 FC 00 50  
96: 68 69 6C 69 70 73 20 31 39 30 56 0A 00 00 00 FD  
112: 00 38 4C 1E 53 0E 00 0A 20 20 20 20 20 20 00 40

Decoded EDID data

<---Header--->

Header: 00 FF FF FF FF FF FF 00

<-x-Header-x->

<---Vendor/Product Identification--->

ID Manufacturer Name: PHL  
ID Product Code: 0081  
ID Serial Number: 0004e729  
Week of Manufacture: 21  
Year of Manufacture: 2003

<-x-Vendor/Product Identification-x->

<---EDID Structure Version/Revision--->

EDID Version#: 01  
EDID Revision#: 03

<-x-EDID Structure Version/Revision-x->

<---Basic Display Parameters/Features--->

Video i/p definition: Digital  
Max. H. Image Size : 40cm.  
Max. V. Image Size : 25cm.

Display Gamma: 2.2

DPMS Features, Active off: Yes.

Display Type: R/G/B color display.

Preferred Timing Mode: Yes.

<---Basic Display Parameters/Features--->

<---Color Characteristics--->

Red x: 0.6386718750

Red y: 0.3417968750

Green x: 0.2968750000

Green y: 0.6142578125

Blue x: 0.1455078125

Blue y: 0.0673828125

White x: 0.3125000000

White y: 0.3291015625

<-x-Color Characteristics-x->

<---Established Timings--->

Established Timings 1: BF

-720x400 @70Hz VGA,IBM

-640x480 @60Hz VGA,IBM

-640x480 @67Hz Apple,Mac II

-640x480 @72Hz VESA

-640x480 @75Hz VESA

-800x600 @56Hz VESA

-800x600 @60Hz VESA

Established Timings 2: EF

-800x600 @72Hz VESA

-800x600 @75Hz VESA

-832x624 @75Hz Apple,Mac II

-1024x768 @60Hz VESA

-1024x768 @70Hz VESA

-1024x768 @75Hz VESA

-1280x1024 @75Hz VESA

Established Timings 3: 80

-1152x870 @75Hz Apple,Mac II

<-x-Established Timings-x->

<---Standard Timing Identification--->

-1152x864@75

-1280x1024 @60

-1440x900@60

<-x-Standard Timing Identification-x->

<---Detailed Timing Descriptions--->

Detailed Timing: 1440x900 @ 60Hz.

<-x-Detailed Timing Descriptions-x->

<---Detailed Timing Descriptions--->

Detailed Timing: FF (Monitor SN) '123232132132'

Detailed Timing: FC (Monitor Name) 'Philips 190V'

Detailed Timing: FD (Monitor limits)

Min. V. rate: 56Hz

Max. V. rate: 76Hz

Min. H. rate: 30KHz

Max. H. rate: 83KHz

Max. Pixel Clock: 140MHz

<-x-Detailed Timing Descriptions-x->

Extension Flag: 00

Checksum: 40

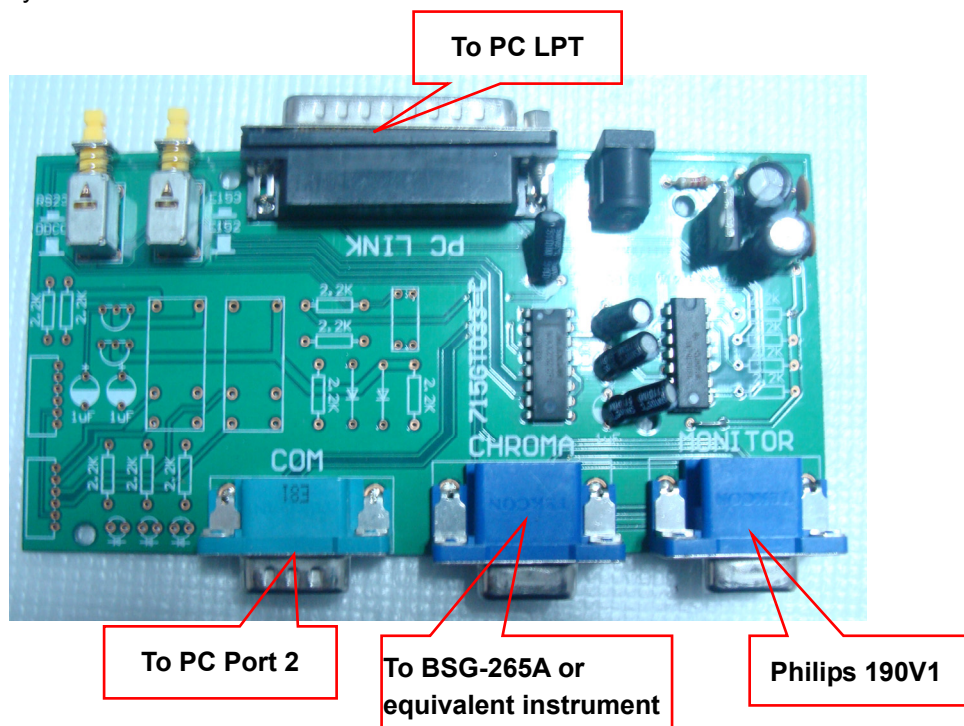
## 14. White Balance, Luminance Adjustment

1. Apparatuses and program: analyzer CA-210, PC, tool, FGA adjustment program (PHILIPS 190V1.DDCI), Pattern generator.

2. Equipment installation:

- Connect analyzer CA-210 to PC by USB connector, install drive program CA-SDK Ver4.00 for CA-210 and restart PC after finish installing
- Install Port95NT drive program, set PC printer connector mode as ECP mode and reset PC after finish installing.
- Connect tool as follow:

Note: It's not necessary to connect Port2.



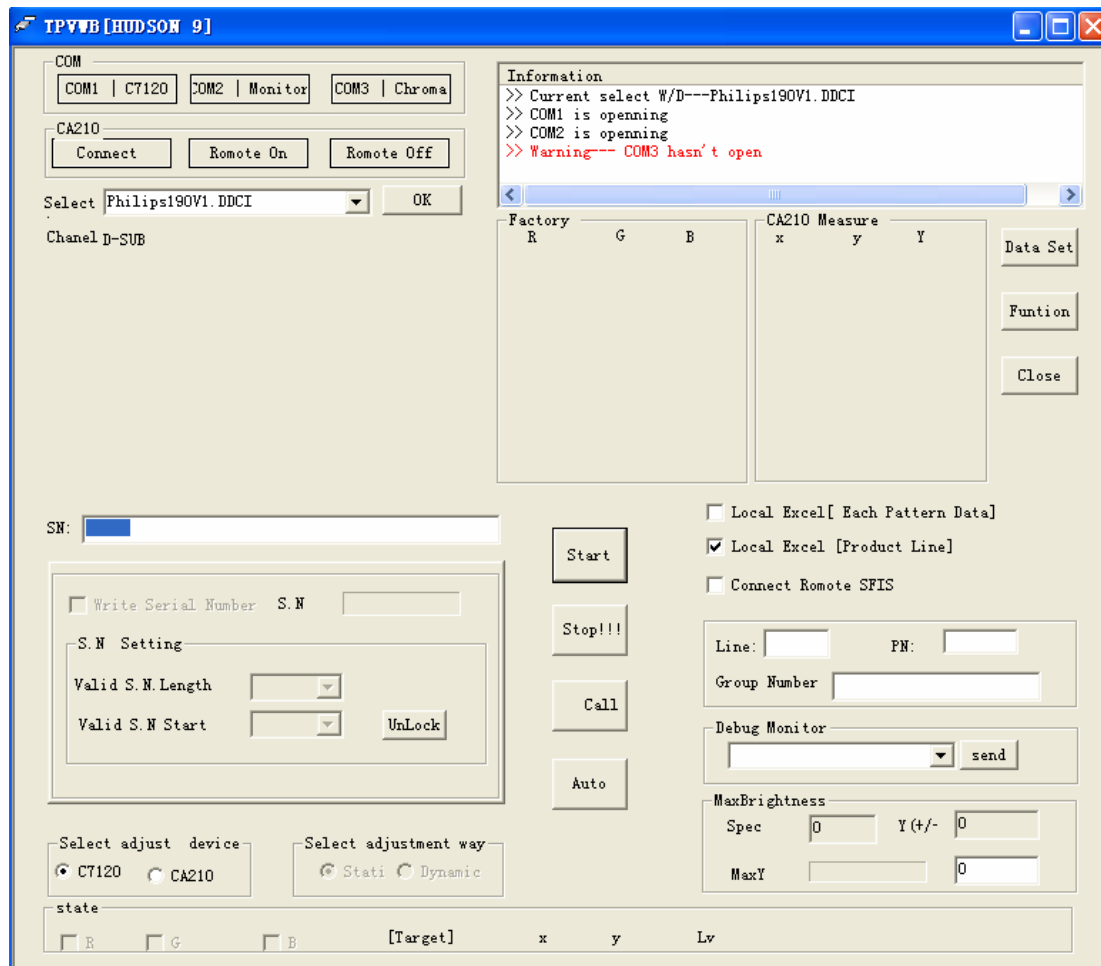
3. Adjustment

Preparation before adjustment:

- Monitor should be warmed up for more than half an hour.
- Make sure that the tools are connected right and drive programs have been installed OK.

Adjustment process:

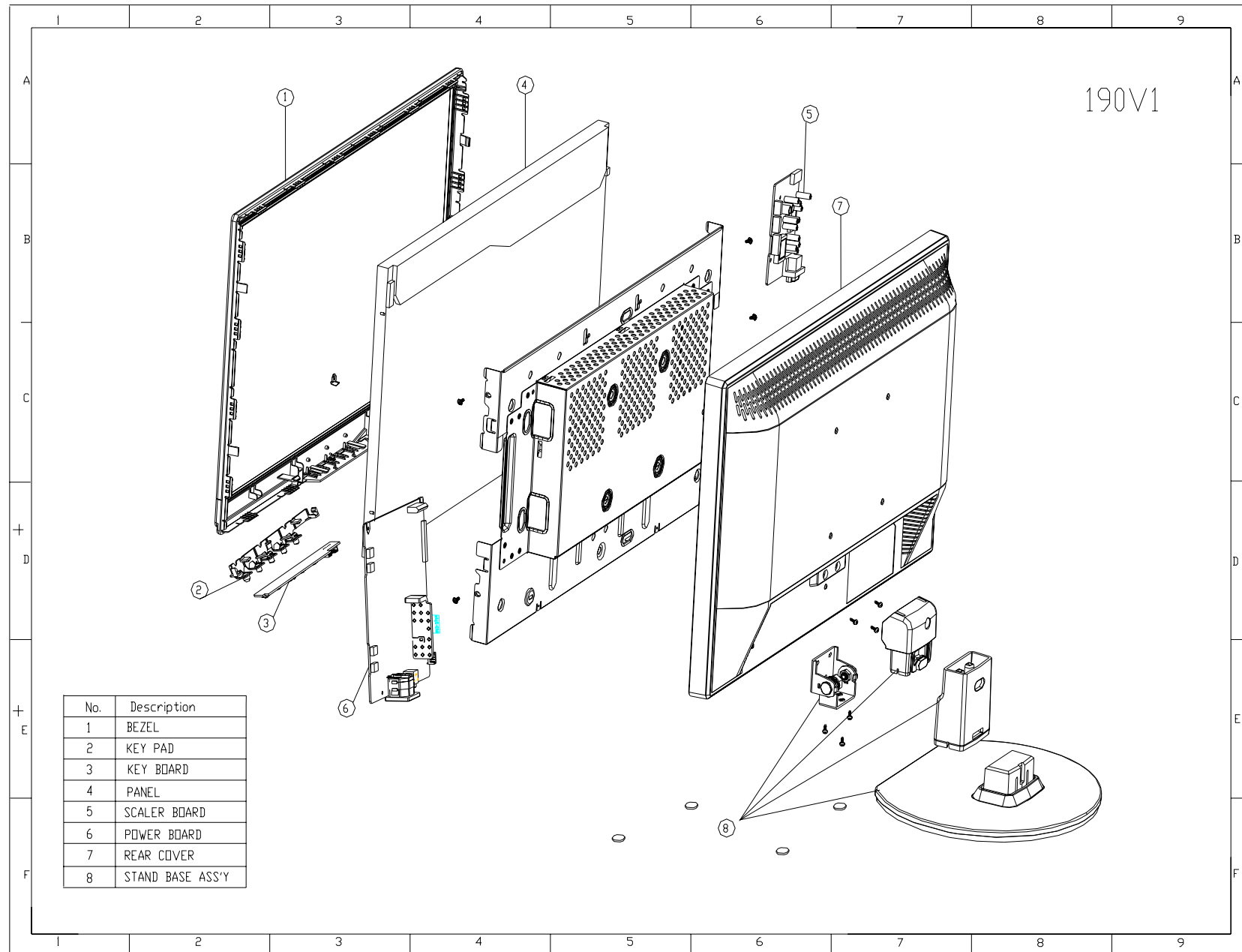
- Press the power of CA-210, shut off the lens, press 0-Cal and open the lens after analyzer reset.
- Open white balance adjustment program, select the right parameter according with the program and click OK.
- Make sure that the lens of CA-210 aims at the center of the screen, then click START to adjust.
- After finish adjusting, the adjustment program displays pass, and the START button changes for NEXT, which means that you can adjust another monitor.



#### 4. Color Temp confirmation

Connect the signal to the monitor, the monitor displays white-picture, use CA-210 to measure the Color Temp of the screen center and select the OSD to make sure whether the Color Temps accord with the SPEC.

# 15. Monitor Exploded View



## 16. Recommended & Spare Parts List

### 190V1SB/93

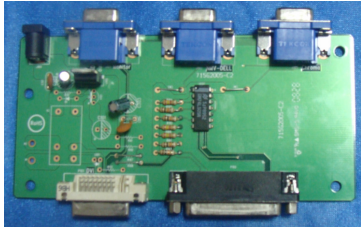
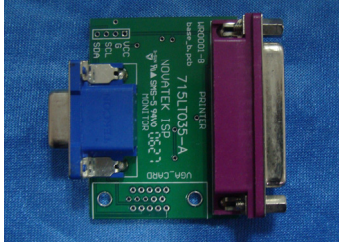
Item	Location	PCM Codes	Description	Remark
1	FQ106	Q34G0410ADTC1B0130	BEZEL (HUDSON9-190V)	
2	FQ405	Q33G0170ADT 1L	KEY PAD	
3	FQ004	KEPC9QV9	KEY BOARD ASSY	
4	FQ001	750GLG190W1H13N000	PANEL LM190WX1-TLH1 GZ LGD	
4	FQ001	750GLM190A1G12N000	PANEL M190A1-L0G C1(B1) NB CMO	
5	FQ002	756GQ9CB PH006	SCALER BOARD(CBPC9NDPHQP)	LGD
5	FQ002	756GQ9CB PH007	SCALER BOARD(CBPC9NDPHQP)	CMO
6	FQ003	PWPC9921MYC1	POWER BOARD ASSY	
7	FQ105	Q34G0265ADT AB0100	REAR COVER19"	LGD
7	FQ105	Q34G0265ADT 5B0100	REAR COVER19	CMO
8	FQ103	705GQ834046	STAND BASE ASSY	
	E08902	089G 728CAA 2G	SIGNAL CABLE	
	E08907	089G179J30N576	FFC CABLE	
	FQ301	089G414A15N IS	POWER CORD	
	FQ204	Q70G900281310A	190V1 CD MANUAL	
	FQ205	705GQ8CS002	CUSHION ASSY	
	FQ202	Q44G9115813 6A	19W LCD PHILIPS CARTON	
	FQ206	Q41G780A81325A	190V1 QSG	
	IC903	056G 139 3A	IC PC123Y22FZ0F	
	T901	080GL22T 3 S1	X'FMR 490uH	
	PT801	080GL24T 23 H	INVERTER X'FMR 68.5uH	
	IC901	056G 379128	IC LD7576 GS SOP-8	
	IC801	056G 608 12	IC ta9687GN-A-0-TR SOP-16	
	IC904	056G 158 12	KIA431A-AT/P TO-92	
	F901	084G 56 4 B	FUSE 4A 250V	
	F903	084G 56 4 B	FUSE 4A 250V	
	U402	100GPNG9003NT1	MCU ASSY(056G1133713)	LGD
	U402	100GPNM9002NT1	MCU ASSY(056G1133713)	CMO
	X401	093G 2251B J	NXS12.000AC30F-BT-2	
	U401	056G 562584	IC NT68667FG/C QFP-128L	
	U703	056G 563 52	IC AP1117D33L-13 TO252-3L DIODES	
	U103	056G 662502	IC ESD AZC199-04S SOT23-6L	
	U104	056G 662502	IC ESD AZC199-04S SOT23-6L	

60

Meridian 1

	U105	056G 662502	IC ESD AZC199-04S SOT23-6L	
	U106	056G 662502	IC ESD AZC199-04S SOT23-6L	
	U107	056G 662502	IC ESD AZC199-04S SOT23-6L	

## Service Kit

Description	Part No.	Philips 12NC	Picture
DDC KIT	715G2005C2	996500043197	
NOVATEK ISP KIT	715LT035A	996500043198	



## 17. Different Parts List

Diversity of 190V1SB /00 compared with 190V1SB/93				
190V1SB /00			190V1SB /93	
Location	PCM Codes	Description	PCM Codes	Description
FQ301	089G404A15N IS	POWER CORD	089G414A15N IS	POWER CORD
FQ202	Q44G9115813 4A	19W LCD PHILIPS CARTON	Q44G9115813 6A	19W LCD PHILIPS CARTON

Diversity of 190V1SB /62 compared with 190V1SB/93				
190V1SB /62			190V1SB /93	
Location	PCM Codes	Description	PCM Codes	Description
FQ301	089G404A15N IS	POWER CORD	089G414A15N IS	POWER CORD
FQ002	756GQ9CB PH021(LGD)	SCALER BOARD(CBPC9NDPHQ5)	756GQ9CB PH006	SCALER BOARD(CBPC9NDPHQP)
FQ002	756GQ9CB PH019(CMO)	SCALER BOARD(CBPC9NDPHQ5)	756GQ9CB PH007	SCALER BOARD(CBPC9NDPHQP)
U402	100GPNG9009NT1(LGD)	PHILIPS 190V1	100GPNG9003NT1	MCU ASSY(056G1133713)
U402	100GPNM9005NT1(CMO)	PHILIPS 190V1	100GPNM9002NT1	MCU ASSY(056G1133713)
FQ105	Q34G0265ADT 9B0100(LGD)	REAR COVER19"	Q34G0265ADT AB0100	REAR COVER19"
FQ105	Q34G0265ADT 4B0100(CMO)	REAR COVER19"	Q34G0265ADT 5B0100	REAR COVER19"
FQ202	Q44G9115813 5A	19W LCD PHILIPS CARTON	Q44G9115813 6A	19W LCD PHILIPS CARTON

Diversity of 190V1SB/27 compared with 190V1SB/93				
190V1SB/27			190V1SB/93	
Location	PCM Codes	Description	PCM Codes	Description
FQ301	089G402A15N IS	POWER CORD	089G414A15N IS	POWER CORD

## 18. General Product Specification

### TABLE OF CONTENTS

1. FOREWORD
2. PRODUCT PROFILE
  - 2.1 LCD
  - 2.2 SCANNING FREQUENCIES
  - 2.3 AMBIENT TEMPERATURE: 0°C-40°C
3. ELECTRICAL CHARACTERISTICS
  - 3.1 INTERFACE SIGNALS
  - 3.2 INTERFACE
  - 3.3 TIMING REQUIREMENT
  - 3.4 HORIZONTAL SCANNING
  - 3.5 VERTICAL SCANNING
  - 3.6 POWER INPUT CONNECTION
  - 3.7 POWER MANAGEMENT (SUPPORT TO INPUT)
  - 3.8 VGA DISPLAY IDENTIFICATION
  - 3.9 DATA FOR EDID & INF FILE
  - 3.10 HOT-KEY DEFINITION
4. VISUAL CHARACTERISTICS
  - 4.1 TEST CONDITIONS
  - 4.2 BRIGHTNESS
  - 4.3 IMAGE SIZE
  - 4.4 BRIGHTNESS UNIFORMITY
  - 4.5 CHECK CROSS TALK(S)
  - 4.6 WHITE COLOR ADJUSTMENT
5. MECHANICAL CHARACTERISTICS
  - 5.1 COSMETIC - - Philips ID
  - 5.2 MECHANICAL DATA FILES ----- PROE FILES REQUIRED
  - 5.3 LOCATION OF PHILIPS LOGO ----- PER PHILIPS MAKE-UP SHEET
  - 5.4 GAP BETWEEN PANEL AND FRONT BEZEL ----- <1.4mm (type), AGREED BY PHILIPS.
  - 5.5 LOCATION OF CONTROL ICONS ----- PER PHILIPS GRAPHIC SHEET
  - 5.6 COLOR FOR RESIN/PAINT ----- PER PHILIPS MAKE-UP SHEET
  - 5.7 RESINS
  - 5.8 IF PAINT IS USED
  - 5.9 PLASTIC MOLD TOOLING
  - 5.10 PLASTICS FLAMMABILITY
  - 5.11 TEXTURE/GLOSSING OF HOUSING
  - 5.12 TILT AND SWIVEL BASE
  - 5.13 KENNSINGTON LOCK
  - 5.14 LABEL
  - 5.15 PRODUCT DIMENSION/WEIGHT (REFER TO PHILIPS APPROVED SHT 191)
  - 5.16 TRANSPORTATION
  - 5.17 PALLET/CONTAINER LOADING

6. ENVIRONMENTAL CHARACTERISTICS

6.1 SUSCEPTIBILITY OF DISPLAY TO EXTERNAL ENVIRONMENT

6.2 TRANSPORTATION TESTS

6.3 DISPLAY DISTURBANCES FROM EXTERNAL ENVIRONMENT

6.4 DISPLAY DISTURBANCES TO EXTERNAL ENVIRONMENT

7. RELIABILITY

7.1 MEAN TIME BETWEEN FAILURES

8. QUALITY ASSURANCE REQUIREMENTS

8.1 ACCEPTANCE TEST

9. PHILIPS' FLAT PANEL MONITORS PIXEL DEFECT POLITY

10. REGULATORY COMPLIANCE

10.1 WORLDWIDE REGULATORY

10.2 EMC REQUIREMENTS

10.3 ROHS

10.4 WEEE

10.5 ONGOING REGULATORY

## 1. FOREWORD

This specification describes a 19" WXGA multi-scan color TFT LCD monitor with maximum resolution up to 1440\*900 /75Hz non-interlaced.

All optical characteristics (including White-D, Brightness and so on) are determined according to panel specification after warming up approximate 30 minutes that brightness stability is optimal, and follow strictly after panel specification.

## 2. PRODUCT PROFILE

This display monitor unit is a color display monitor enclosed in Philips styling cabinet which has an integrated tilt base.

### LCD

Tier1: 1. LGD 19", CMO 19"

Type NR.	: LGD, LM190WX1-TLH1
Outside dimensions	: 428.0(W) x 278.0(H) x 16.5(D) mm(Typ.)
Pitch (mm)	: 0.2835(H) x 0.2835(V)
Color pixel arrangement	: RGB vertical stripe
Display surface	: Hard coating (3H), Anti-glare treatment of the front polarizer
Color depth	: 16.7M colors
Backlight	: CCFL edge light system
Active area (W xH)	: 408.24 mm x 255.15 mm
View angle	: R/L 170(Typ.), U/D 160(Typ.)
Contrast ratio	: 1000:1 (Typ.)
DCR	: 12000:1
White Luminance	: 250 cd/m2 ( Center 1Point, Typ.)
Gate IC	:
Source IC	:
Response time	: 5ms (Typ.)
MTBF	:

Type NR.	: CMO, M190A1-L0G
Outside dimensions	: 428 (W) x 278(H) x 16.0(D) (Typ) mm
Pitch (mm)	: 0.2835(H) x 0.2835(V)
Display surface	: Low reflection, antiglare with hard coating
Color depth	: 16.7M colors
Backlight	: CCFL edge light system
Active area (W x H)	: 408.24 mm x 255.15 mm
View angle (CR>10)	: Horizontal 85(Typ.), Vertical 80(Typ.)
Contrast ratio	: 630:1(Min) 1000:1(Typ.)
DCR	: 12000:1
White Luminance	: 250 nits (Typ.)
Gate IC	:
Source IC	:
Response time	: 5ms (Typ.)
MTBF	:

## 2.2 Scanning frequencies

Hor. : 30 – 80 KHz  
 Ver. : 56 - 76 Hz  
 Video dot rate : <140 MHz  
 Power input : 90-264 V AC, 50/60 ± 2 Hz  
 Power consumption : <25W maximum, < 22W (Typ.)

Functions:

(1) D-SUB analog R/G/B separate inputs, H/V sync separated, Composite (H+V) TTL level, SOG sync

## 2.3 Ambient temperature: 0 °C - 40 °C

## 3 ELECTRICAL CHARACTERISTICS

### 3.1 Interface signals

(1) D-sub analog

Input signal :Video, Hsync, Vsync  
 Video :0.7 Vp-p, input impedance, 75 ohm @DC  
 Sync Separate sync TTL level, input impedance 2.2K ohm terminate  
 :Hsync Positive/Negative  
 :Vsync Positive/Negative  
 Composite sync TTL level, input impedance 2.2k ohm terminate  
 (Positive/Negative)  
 Sync on green video 0.3 Vp-p Negative (Video 0.7 Vp-p Positive)

### 3.2 Interface

#### 3.2.1 D-SUB Cable

Length 1.5m +/- 50mm  
 Not fix with monitor when packing (agreed by Philips), with transplant pin protective cover.  
 Connector type D-sub male with DDC2B pin assignments  
 Blue connector thumb-operated jack screws

Pin assignments

PIN No.	SIGNAL
1	Red
2	Green/ SOG
3	Blue
4	Sense (GND)
5	Cable Detect (GND)
6	Red GND
7	Green GND
8	Blue GND
9	DDC +3.3V or +5V
10	Logic GND
11	Sense (GND)
12	Bi-directional data
13	H/H+V sync
14	V-sync
15	Data clock

### 3.2.2 Software control functions via OSD/Control adjustment functions

Please refer to following Hudson 8 OSD definitions

Auto\Back	Input\ ▼	Brightness\ ▲	Menu\Enter	Power
-----------	----------	---------------	------------	-------

Reset - No: Exit

Yes: Auto adjustment for displaying timing mode and recall factory preset

OSD Languages

English	Spanish	French	German	Italian	Portuguese	Russian	Turkish	S. Chinese
---------	---------	--------	--------	---------	------------	---------	---------	------------

OSD Tree

Level 1	Level 2	Level 3	Default	Note
Picture	Brightness	(0~100)	100	
	Contrast	(0~100)	50	
Color	Color Temp.	(6500K,9300K)	6500K	
	sRGB			
	User Define	(Red:0~100)	100	
		(Green:0~100)	100	
		(Blue:0~100)	100	
Language	English		(English)	Factory reset only
	Espanol			
	Francais			
	Deutsch			
	Italiano			
	Portugues			
	Russia			
	Turkish			
	S.Chinese			
OSD Setting	Horizontal	(0~100)	50	
	Vertical	(0~100)	50	
	Transparency	(Off, 1, 2, 3, 4)	Off	
	OSD Time out	(5, 10, 20, 30, 60)	20	



Setup	Phase	(0~100)		
	Clock	(0~100)		
	H.Position	(0~100)		
	V.Position	(0~100)		
	Reset	(Yes, No)	No	
	Resolution Notification	(On, Off)	Off	
	Information			

Power on Logo



1024x768\_philips\_de  
sktop\_1.bmp

Power on→ Show PHILIPS logo 3 sec. --> change to input signal

Any deviation between document and sample, than refer to approved sample by Philips.

### 3.3 Timing requirement

**Factory Preset mode definition:**

1. Perfect FOS while presenting all required timings
2. Required timing need to be specified in User's Manual

**User mode**

1. Can be showed (not over scalar or panel spec.)
2. It needs to reserve the 22 timings space in memory size.

#### 3.3.1 Mode storing capacity

Factory preset modes : 11

User modes : 22

Notes:

1. Screen displays perfect picture at 11 factory-preset modes
2. Screen displays visible picture with OSD warning when input modes are the 22 reset mode

#### 3.3.2 Factory preset modes

Factory modes and preset modes are defined in the enclosed timing table file

Support Timing	Preset Timing	Resolution			Pixel Rate ( MHz )	Horizontal ( KHz )	Vertical ( Hz )	V_Total ( Line )	Polarity ( H / V )
*		DOS		640x350/70	25.18	31.47	70.09	449	p / n
*	*	DOS		720x400/70	28.32	31.47	70.09	449	n / p
*	*	DMT	4:3	640x480/60	25.18	31.47	59.94	525	n / n
*		MAC		640x480/67	30.24	35.00	66.67	525	n / n
*		DMT	4:3	640x480/72	31.50	37.86	72.81	520	n / n
*	*	DMT	4:3	640x480/75	31.50	37.50	75.00	500	n / n
*		DMT	4:3	800x600/56	36.00	35.16	56.25	625	p / p

*	*	DMT	4:3	800x600/60	40.00	37.88	60.32	628	p / p
*		DMT	4:3	800x600/72	50.00	48.08	72.19	666	p / p
*	*	DMT	4:3	800x600/75	49.50	46.88	75.00	625	p / p
*		MAC		832x624/75	57.28	47.73	74.55	667	n / n
*	*	DMT	4:3	1024x768/60	65.00	48.36	60.00	806	n / n
*		DMT	4:3	1024x768/70	75.00	56.48	70.07	806	n / n
*	*	DMT	4:3	1024x768/75	78.75	60.02	75.03	800	p / p
*		DMT		1152x864/75	108.00	67.50	75.00	900	p / p
*		MAC		1152x870/75	100.00	68.68	75.06	915	n / n
*		SUN		1152x900/66	92.94	61.80	65.95	937	p / p
*		SUN		1152x900/76	105.56	71.71	76.05	943	p / p
*		CVT	16:9	1280x720/60	74.50	44.77	59.86	748	n / p
*		CVT	16:9	1280x720/75	95.75	56.46	74.78	755	n / p
*		CVT	15:9	1280x768/60	79.50	47.78	59.87	798	n / p
*		CVT	15:9	1280x768/75	102.25	60.29	74.89	805	n / p
*		CVT		1280x800/60	83.50	49.70	59.81	831	n / p
*		CVT		1280x800/75	106.50	62.80	74.93	838	n / p
*		DMT	4:3	1280x960/60	108.00	60.00	60.00	1000	p / p
*	*	DMT	5:4	1280x1024/60	108.00	63.89	60.02	1066	p / p
*		SUN	5:4	1280x1024/66	117.00	71.70	67.00	1067	p / p
*	*	DMT	5:4	1280x1024/75	135.00	79.98	75.03	1066	p / p
*		SUN	5:4	1280x1024/76	138.01	81.10	76.00	1066	n / n
*		DMT	16:9	1360x768/60	85.50	47.71	60.02	795	p / p
*		CVT	16:9	1360x768/75	109.00	60.29	74.89	805	n / p
*		CVT		1440x900/60_RB	88.75	55.47	59.90	926	p / n
	*	CVT		1440x900/60	106.50	55.94	59.89	934	n / p
*	*	CVT		1440x900/75	136.75	70.64	74.98	942	n / p
33	11								

### 3.4 Horizontal scanning

Sync polarity : Positive or Negative

Scanning frequency : 30-83KHz

### 3.5 Vertical scanning

Sync polarity : Positive or Negative

Scanning frequency : 56-76Hz

### 3.6 Power input connection

Power cord length :1.5m

Power cord type :3 leads power cord with protective earth plug

### 3.7 Power management (supplier to input)

The monitor must comply with the Microsoft on Now specification and meet EPA requirement.

Mode	HSYNC	VSYNC	Video	Pwr-cons.	Indication	Rec. time
Power-On	On	On	active	< 25W Max.	Green LED	--
				<22W Typ.		
Power saving	Off	Off	blanked	< 0.8W	Amber LED	< 3 s
DC Power Off			N/A	< 0.5 W	LED Off	

\* Energy star report less than 33 watt

### 3.8 VGA Display identification

In accordance with VESA Display Channel Standard Ver.1.0 and DDC 2B capability

### 3.9 Data for EDID & INF file

Data for EDID & .inf file

1	User visible strings on .inf file	Philips 190V1(19inch WIDE LCD MONITOR 190V1)
2	Manufacturer ID ( EDID data)	PHL
3	Product ID, "xxxx" 4 codes	MSB(byte 12): 08
		LSB (byte 11): 81
4	maximum resolution	1440x900
5	Horizontal Frequency Range	30~83 KHz
6	Vertical Frequency Range	55~76Hz
7	Monitor Name (13 characterizes max.)	Philips 190V

### 3.10 Hot-key definition

Item	Key	Key press time	OSD Timeout	OSD Message
Monitor Controls Lock	[Menu]	6 sec	5 sec	MONITOR CONTROLS LOCKED MONITOR CONTROLS UNLOCKED (default)
Factory Mode	[AUTO]+[Menu]+[Power]			
DDC/CI On/OFF for VISTA	[MENU]+[DOWN]	5 sec	5 sec	DDC/CI ON (default) DDC/CI OFF

Any deviation between document and sample, please refer to Philips approved sample.

## 4 Visual characteristics

### 4.1 Test conditions

Unless otherwise specified, this specification is defined under the following conditions.

- (1) Input signal: As defined in 3.3, 1440\*900  
non-interlaced mode (1440\*900@60Hz 140MHz), signal sources must have  
75 ohm output impedance
- (2) Luminance setting: controls to be set to 300 nits with full screen 100 % duty cycle white signal
- (3) Warm up: More than 30 minutes after power on with signal supplied.
- (4) Ambient light: 400 -- 600 lux
- (5) Ambient temperature: 20 ± 5 °C

### 4.2 Brightness

To follow Panel specification

### 4.3 Image size

Actual display size: Refer to 2.1 LCD PANEL spec.

### 4.4 Brightness uniformity

Set contrast at 100% and turn the brightness to get average above 300 nits at centre of the screen. Apply the Fig 1; it should comply with the following formula:

$$\frac{B_{\min}}{B_{\max}} \times 100\% > 75\% \text{ (Follow panel spec)}$$

Where B\_max =Maximum brightness

B\_min = Minimum brightness

### 4.5 Check Cross talk(s)

Apply Pattern 2. Set contrast and brightness at 100 %. Measure YA. Then output Pattern 3 and measure YB. The cross talk value:

$$\frac{ABS(YA - YB)}{YA} \times 100\% < 1.5\%$$

### 4.6 White Color adjustment

There are three factory preset white color 9300K, 6500 and sRGB align by FGA function.

Apply full gray 64 pattern, with brightness in 100 % position and the contrast control at 50 % position.

The 1931 CIE Chromaticity (color triangle) diagram (x, y) coordinate for the screen center should be:

## Product specification

CIE coordinates	(x,y)
9300K	x = 0.283 ± 0.015 y = 0.297 ± 0.015
6500K/sRGB	x = 0.313 ± 0.015 y = 0.329 ± 0.015
sRGB	x = 0.313 ± 0.015 y = 0.329 ± 0.015

## 5 Mechanical characteristics

5.1 Cosmetic	Philips ID
5.2 Mechanical data files	ProE files required
5.3 Location of Philips Logo	Per Philips make-up sheet
5.4 Gap between panel and front bezel	< 1.4mm (typ.)
5.5 Location of Control Icons	Per Philips Graphic sheet
5.6 Color for resin/paint	Per Philips make-up sheet

### 5.7 Resins

- RoHS required
- WEEE required.
- Resin type/selection refers to Project Book Section 7.2 Plastic material.

### 5.8 If paint is used

- RoHS required
- WEEE require
- If new painting type needs to implement, refer to UN-D 1235.

### 5.9 Plastic mold tooling

- Tooling to be designed to minimize cosmetic defects induced by molding process (sink, blush, weld lines, gate marks, ejector marks, etc.). Refer to "TYV61-90007".
- Painting to cover up cosmetic defects due to molding is strongly discouraged.
- China RoHS mark requested.

### 5.10 Plastics flammability

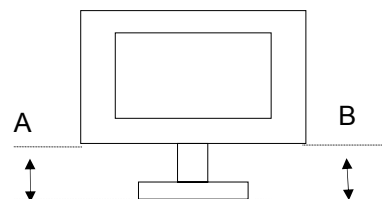
- All Plastics to be Flame Retardant UL 94-HB.
- Base / Rear to be Flame Retardant UL 94-HB
- All major plastic parts (bezel, back cover) need to be molded from same resin. Plastic resin type selection should be referred to "TY R83-2-9002-1".

### 5.11 Texture/Glossing of housing

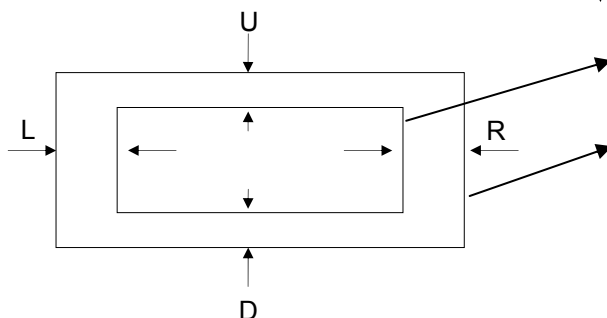
- The texture area and texture no should follow Philips make-up sheet.
- The exterior surfaces shall have a uniform texture.
- Philips must approve the mold texturing.
- Detail document for texture refer to "UN-D249", "UN-D 600".
- > = 80 gloss units

## 5.12 Tilt and swivel base

- Tilt angle :  $-5^{\circ} +2/-0^{\circ}$  (forward)  
 $+20^{\circ} +0/-2^{\circ}$  (backward)
- Tilt for left and right:  
 $|A-B| \leq 4.0\text{mm}$



- Black side and cut side:



- Visual area  
 $H: |L-R| \leq 1.5\text{mm}$   
 $V: |U-D| \leq 1.5\text{mm}$
- Black side on the left and right is symmetrical, not cut side.

- Gap between bezel and rear cover 0.4 mm (Typ.)
- Step between bezel and rear cover Left, right and top:  $\leq 0.6\text{mm}$  Bottom and corner:  $\leq 1.1\text{mm}$
- "Wobble", "Twist", etc (front to back or side to side)

Whole monitor set shall retain stability within a short time after the applied external force disappears.

20NT, 6secs (Max.) back to stable.

## 5.13 Kensington Lock

- Must meet Kensington\_slot.spec "TYE-M0004".

## 5.14 Label

- Carton label should follow Philips requirement.
- Regulatory label follow Philips requirement
- China RoHS label
- Detail document refer to Philips Engineering Reference Book

## 5.15 Product dimension / Weight (Refer to Philips approved SHT 191/SHT560)

- Unit dimension : 439(w)\*363(H)\*191(D)
- Packed unit dimension: : 490(w)\*375(D)\*145(H)
- Net weight : 3.98Kg
- Gross weight : 4.95Kg.

## 5.16 Transportation

Transportation standards refer to TPV standard

### 5.16.1 Transportation packages

Packaging and wrapping shall be sufficient to protect the product against damage or loss during shipment from the supplier to the destination specified in the purchase order. All packaging materials are subject to test and evaluation per TPV standard. The cushion material shall be constructed using EPS material.

#### 5.16.2 Transportation Test

Follow TPV standard

##### Transportation test specification for all regions

- Random Vibration test
- Drop test

#### 5.17 Pallet / Container loading

Transportation standards refer to TPV standard.

- Air shipment.
- Sea container 20'(pallet/slip sheet)
- Sea container 40'(pallet/slip sheet)
- Sea container 40' High Cube (pallet/slip sheet)
- Land 53' Truck and Trailer (800X1200mm pallet)
- Land 45' Truck and Trailer (1000X1200mm pallet)
- Truck shipment.

### 6 Environmental characteristics

The following sections define the interference and susceptibility condition limits that might occur between external environment and the display device.

#### 6.1 Susceptibility of display to external environment

##### Operating

Temperature	: 0 to 40 degree C
Humidity	: 20~90% RH (non-condensed)
Altitude	: 0-10000 ft

##### Storage

Temperature	: -20 to 60 degree C
Humidity	: 10~90% RH (non-condensed)
Altitude	: 0-30000 ft

Note: Please also refer to DQE requirements.

#### 6.2 Transportation tests

Refer to 5.15.2

#### 6.3 Display disturbances from external environment

According to IEC 801-2 for ESD disturbances

#### 6.4 Display disturbances to external environment



## 7 Reliability

### 7.1 Mean Time between Failures

System MTBF (excluding the LCD panel and CCFL): Refer to 2.1 panel MTBF

## 8 Quality assurance requirements

### 8.1 Acceptance test

According to MIL-STD-105D Control II level

AQL: 0.4 (major)

1.5 (minor)

(Please also refer to annual quality agreement) Customer acceptance criteria: UAW0377/00

## 9 Philips' Flat Panel Monitors Pixel Defect Policy

Philips' Flat Panel Monitors Pixel Defect Policy

BRIGHT DOT DEFECTS	ACCEPTABLE LEVEL
MODEL	190V1
1 lit sub-pixel	3
2 adjacent lit sub-pixels	1
3 adjacent lit sub-pixels (one white pixel)	0
Distance between two bright dot defects*	$\geq 25\text{mm}$
Bright dot defects within 20 mm circle	0
Total bright dot defects of all type	3

BLACK DOT DEFECTS	ACCEPTABLE LEVEL
Model	190V1
1 dark sub-pixel	5
2 adjacent dark sub-pixels	2
3 adjacent dark sub-pixels (one white pixel)	0
Distance between two black dot defects*	$\geq 15\text{mm}$
Black dot defects within 20 mm circle*	1
Total black dot defects of all type	5

TOTAL DOT DEFECTS	ACCEPTABLE LEVEL
Model	220E1
Total bright or black dot defects of all type	5

\* 1 or 2 adjacent sub-pixel defects = 1 dot defect

Fig 1: Measurement locations of Brightness Uniformity

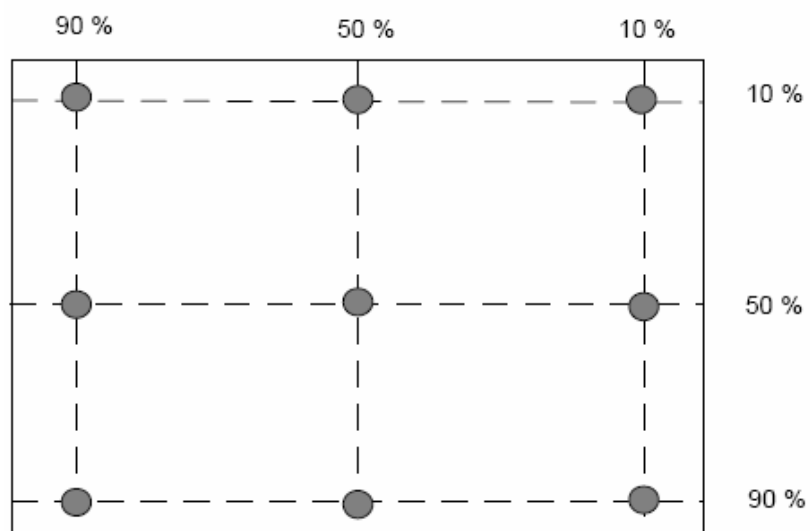


Fig 2: Cross talk pattern Gray level 46 (64 Gray level)

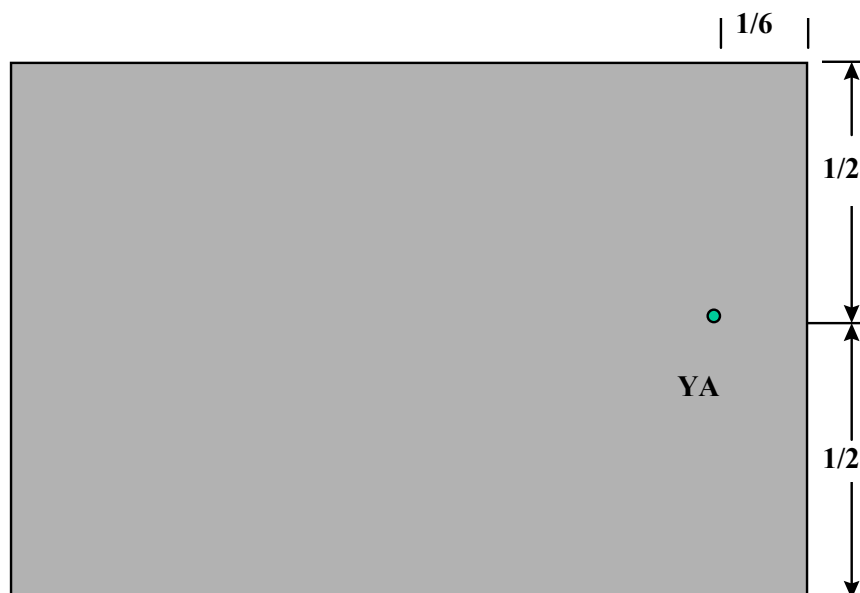
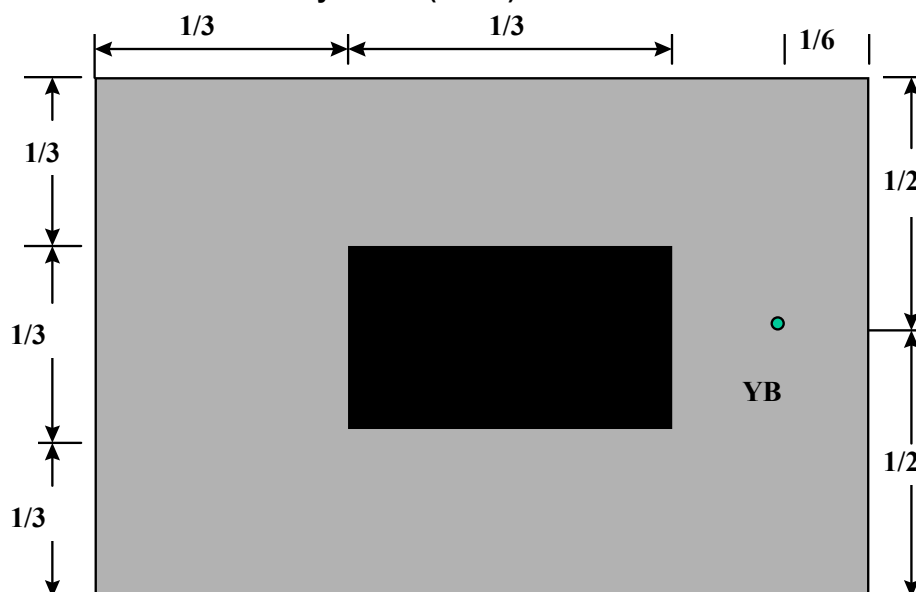

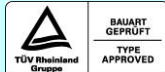











Fig 3: Cross talk Pattern Center at Gray level 0 (Black)



















## 10 REGULATORY COMPLIANCE


### 10.1 Worldwide Regulatory

REGION (RSO)	COUNTRY (NSO)	DOMAIN	SAFETY / ERGONOMICS / EMC / STANDARDS	DOCUMENTS	REFERENCE LOGO	APPLICANT	Mandatory	V-line	Remark
World wide	World wide	Sa	IEC60950-1:2001. Group and national differences of all countries listed in CB Bulletin No. 107A	CB Report, certificate		OEM	Yes	Yes	Manufacture and Applicant is Philips Maximum ambient temperature:40°C
Europe	EUROPE	Sa	European Low Voltage Directives 73/23/EEC and 93/68/EEC, 2004/108/EC	Declaration of Conformity and Identity declaration		OEM	Yes	Yes	
		E	European Electromagnetic Compatibility Directive 2004/108/EC EN55022:2006, EN55024:1998+A1:2001+A2:2003, EN61000-3-2:2006, EN61000-3-3:1995+A1:2001+A2:2005	EMC/CE test report		OEM	Yes	Yes	HDMI have to test PC mode and DVD mode
	GERMANY	Sa	EN60950-1:2001	TUV certificate		OEM	Optional	No	Philips is OEM licence holder
		O	LCD: ISO13406-2, prEN 50279:1998	TUV-ERG certificate and TUV ISO13406-2 report		OEM	Optional	No	Philips is OEM licence holder
		O	GS-Mark / EK1-ITB 2000	TUV-GS certificate		OEM	Optional	No	Philips is OEM licence holder
		O	ISO13406-2	TUV ISO13406-2 certificate		OEM	Optional	No	Philips is OEM licence holder
		O	TUV MPR-II	TUV MPR-II certificate		OEM	Optional	No	Philips is OEM licence holder
	SWEDEN	Sa	EN60950-1:2001	SEMKO certificate		OEM	Optional	No	Philips is licence holder

78	Meridian 1	http://bbs.520101.com							
		O	TCO'99	TCO report and certificate		OEM	Optional	No	To add all sales name into certificate
		O	TCO'03, or TCO'0x supersedes new standard	TCO report and certificate		OEM	Optional	No	To add all sales name into certificate
		O	TCO'06	TCO report and certificate		OEM	Optional	No	To add all sales name into certificate
	Switzerland	Sa	EN60950-1:2001	S+ PZ1 certificate		OEM	Yes	No	Supplier to contact Philips NSO Heidi and apply for Switzerland certification. Supplier to pay approbation cost 2450 CHF each model and each extend model 300 CHF. To provide CB, EMC report, Identity Declaration, DFU, Label, Circuit diagram, PO, Power of Attorney. To add all sales name and /00, /05, /69 into certificate.
		E	EN55020,EN55024, IEC61000-3-2 ,IEC61000-3-3	S+ PZ1 certificate			Yes	No	
		O	EMF EN 50392	EN 50392 report				Yes	No
	Eastern Europe	Sa	EN60950-1:2001	Certificate of Conformity		Philips	Yes	Yes	Supplier ship out 3 samples to Hungary and pay transportation cost. Supplier to provide CB, EMC report, Identity Declaration, DFU, Label, Circuit diagram.
		E	EN55022,EN55024, IEC61000-3-2 ,IEC61000-3-3	Certificate of Conformity		Philips	Yes	Yes	

	RUSSIA	Sa	GOST R 50377-1992	GOST certificate		Philips	Yes	Yes	Supplier to provide CB, EMC, ISO13460-2 report and TCO certificate
	ISRAEL	Sa	IS 1121, IEC60950/IEC60950-1	Certificate of Conformity		OEM	Yes	No	Need to provide Israel user manual and Local representative
	ISRAEL	E	CISPR22	Certificate of Conformity		OEM	Yes	No	
AP	KOREA	Sa	Korean Safety Control law IEC 60950	eK certificate		OEM	Yes	No	NOT REQUIRED
		E	Regulations laws: EMI 1996-78, 80. EMS 1996-79,81	MIC certificate		OEM	Yes	No	NOT REQUIRED
	SINGAPORE	Sa	IEC60950	PSB certificate		OEM	Yes	Yes	Supplier to provide local representative
	CHINA	Sa	GB4943-2001	CCC certificate		OEM	Yes	Yes	Supplier have to check regulation information on rating label, cartor label, user maunal to meet all mandatory regulation. Supplier to provide CCC permission of printing
		E	GB9254-1998; 17625.1-2003	CCC certificate		OEM	Yes	Yes	
		O	CSC/G1205-2004	CECP certificate		OEM	Optional	No	
	TAIWAN	Sa	CNS-14336 (IEC 60950-1)	BSMI certificate		OEM	Yes	Yes	To add all sales name into certificate
		E	CNS-13438 (CISPR22) Class B	BSMI certificate		OEM	Yes	Yes	
		O	Criteria 18 ( Monitor ) ( LCD )	GreenMark / certificate		OEM	Optional	No	NOT REQUIRED

80	Meridian 1								
	AUSTRALIA/ NEW-ZEALAND	E	AS/NZS3548:1995 AS/NZS CISPR22: 2002 Class B	CB, EMC report		OEM	Yes	Yes	Supplier ship out 1 sample to Australia and pay transportation cost, Supplier to apply for C-Tick through Philips NSO
	Saudi Arabia	Sa	EN60950-1:2001	SASO		OEM	Yes	Yes	
	Saudi Arabia	Sa	EN55022, EN61000-3-2, EN61000-3-3, EN55024	SASO		OEM	Yes	Yes	
	Japan	E	VCCI class B (CISPR 22)	VCCI Certificate		OEM	Yes	No	NOT REQUIRED
	Cambodia	Sa	EN60950-1:2001	ISC certificate		OEM	Yes	No	
	Kuwait	Sa	EN60950-1:2001, 'Kuwait Conformity Assurance Scheme' (KUCAS)	KUCAS registration		OEM	Yes	Yes	
NAFTA	USA	Sa	UL 60950-1: 2003	UL certificate, cUL		OEM	Optional	Yes	
		E	FCC Part 15 Class B	FCC report and DoC		OEM	Yes	Yes	To list manufacture in FCC report
		O	Energy Star	EPA test data		OEM	Optional	No	
	CANADA	Sa	CSA C22.2 No 60950	CSA certificate or cUL		OEM	Optional	No	
		E	ICES-003 issue 3	Statement on label		OEM	Yes	Yes	
	MEXICO	Sa	NOM-019-SCFI-1994	NOM certificate		Philips	Yes	No	NOT REQUIRED
LATAM	Argentina	Sa	EN60950-1:2001	TUV S-mark or IRAM		OEM	Yes	No	

	Brazil	Sa	UL 60950-1: 2003	UL certificate or cUL		OEM	Optional	No	
		E	FCC Part 15 Class B	FCC report and DoC		OEM	Yes	Yes	
		O	Energy Star	EPA test data		OEM	Optional	No	
		O	TCO'99	TCO report and certificate		OEM	Optional	No	To add all sales name into certificate
		O	TCO'03	TCO report and certificate		OEM	Optional	No	To add all sales name into certificate
		O	TCO'06	TCO report and certificate		OEM	Optional	No	To add all sales name into certificate
South Africa	SOUTH AFRICA	Sa	SABS IEC 60950 and IEC 60950-1	Certificate of Conformity		Philips	Yes	Yes	Supplier to provide CB, EMC report
		E	EN55022 or Cisper 22	Certificate of Conformity		Philips	Yes	Yes	

Sa = Safety

E = Electromagnetic Compatibility

O = Other which including recycling, energy saving, ergonomics ,Green Mark

Notes:

1. Supplier to provide all approbation documents, samples before CR.
2. Supplier to pay approbation samples and transportation cost.
3. Supplier to pay Switzerland approbation cost 2450 CHF and to provide EN50392 report.
4. HDMI have to test PC mode if user manual have HDMI connect to PC function.
5. Supplier to provide EMC, safety report if monitor with portrait and landscape function.
6. AC/DC adaptor has to meet California Energy Commission requirement.
7. Supplier has to support Philips NSO to get local approbation.
8. Supplier has to check regulation information on rating label, carton label and user manual to meet all mandatory regulation.
9. Supplier need to add Philips sales name, model no into BSMI, TCO, eK, MIC certificate.
10. Supplier has to apply all mandatory regulation bases on sales country.

## 10.2 EMC Requirements

Supplier DVT EMI test result must be submitted prior to DVT samples delivery, and PVT EMI test result must be submitted again prior to PVT samples delivery which also has to meet Philips' immunity testing specification.

## 10.3 RoHS

Restriction on the use of certain hazardous substances:

Lead, Cadmium, Mercury, Hexavalent Chromium, Polybrominated Biphenyl (PBB) and Polybrominated Biphenyl Ether (PBDE) (flame retardant).

## 10.4 WEEE

Producer (Philips) responsible for retailer takes back schemes and recycling.

--System implemented.

--Collection and recycle targets.

## 10.5 Ongoing Regulatory

There's a possibility that other regulatory certificates will be required during the life of the product. It is the responsibility of the supplier to provide related documentation.



## TELEVISION/MONITOR SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

### Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous service may have left an unsafe condition, which could be unknowingly passed on to your customer. Be sure to check all of the following:

### Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed in accordance with the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with an asterisk by the Ref. No. in the parts list and enclosed within a broken line \* (where several critical components are grouped in one area) along with the safety symbols on the schematic diagrams and/or exploded views.
7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug.) Defeating this safety feature may create a potential hazard to the service and the user. Extension cords which do not incorporate the polarizing feature should never be used.
9. After reassembly of the unit, always perform a leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc. to be sure the unit may be safely operated without danger of electrical shock.

\* Broken line

### Implosion

1. All picture tubes used in current model receivers are equipped with an integral implosion system. Care should always be used, and safety glasses worn, whenever handling any picture tube. Avoid scratching or otherwise damaging the picture tube during installation.
2. Use only replacement tubes specified by the manufacturer.

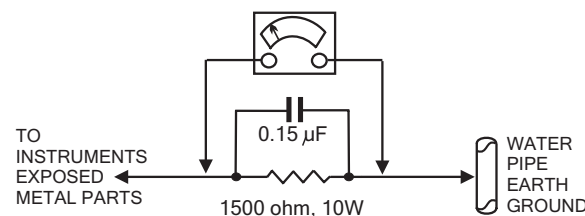
### X-radiation

1. Be sure procedures and instructions to all your service personnel cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the high voltage at the factory recommended level.
2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturer's specified anode connectors must be used.
3. It is essential that the service technician has an accurate HV meter available at all times. The calibration of this meter should be checked periodically against a reference standard.
4. When the HV circuitry is operating properly there is no possibility of an X-radiation problem. High voltage should always be kept at the manufacturer's rated value - no higher - for optimum performance. Every time a color set is serviced, the brightness should be run up and down while monitoring the HV with a meter to be certain that the HV is regulated correctly and does not exceed the specified value. We suggest that you and your technicians review test procedures so that HV and HV regulation are always checked as a standard servicing procedure, and the reason for this prudent routine is clearly understood by everyone. It is important to use an accurate and reliable HV meter. It is recommended that the HV recorded on each customer's invoice, which will demonstrate a proper concern for the customer's safety.
5. When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, reduce the line voltage by means of a Variac to bring the HV into acceptable limits while troubleshooting. Do not operate the chassis longer than necessary to locate the cause of the excessive HV.

6. New picture tubes are specifically designed to withstand higher operating voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.
7. It is essential to use the specified picture tube to avoid a possible X-radiation problem.
8. Most TV receivers contain some type of emergency "Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode. These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

### Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



### Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.
2. Connect a 1.5k, 10w resistor paralleled by a 0.15uf. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 milliamps. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed. (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

### Picture Tube Replacement

The primary source of X-radiation in this television receiver is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement tube must be the same type as the original, including suffix letter, or a Philips approved type.

### Parts Replacement

Many electrical and mechanical parts in Philips television sets have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part shown in this service manual may create shock, fire, or other hazards.

**WARNING:** Before removing the CRT anode cap, turn the unit **OFF** and short the HIGH VOLTAGE to the CRT DAG ground.  
**SERVICE NOTE:** The CRT DAG is not at chassis ground.